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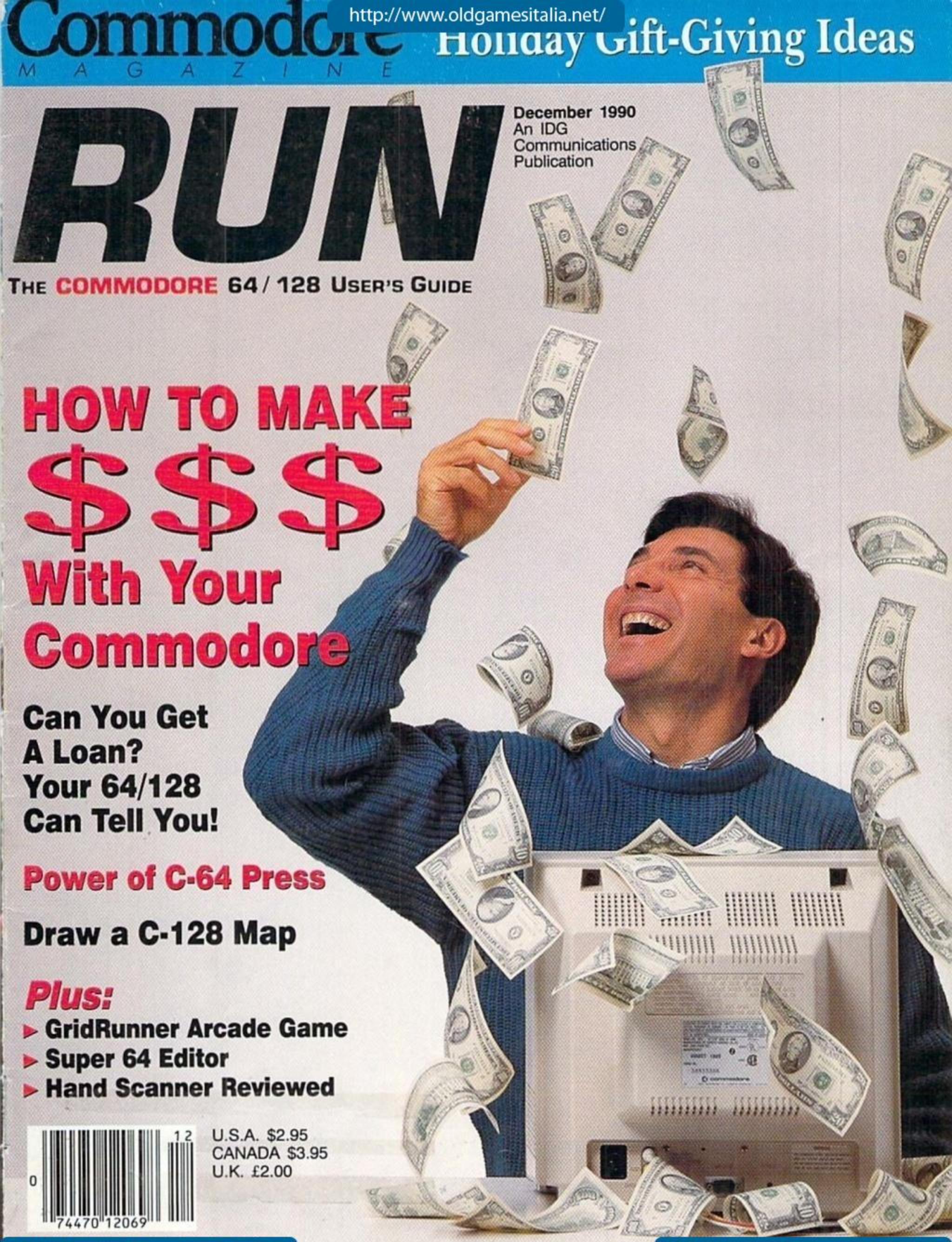

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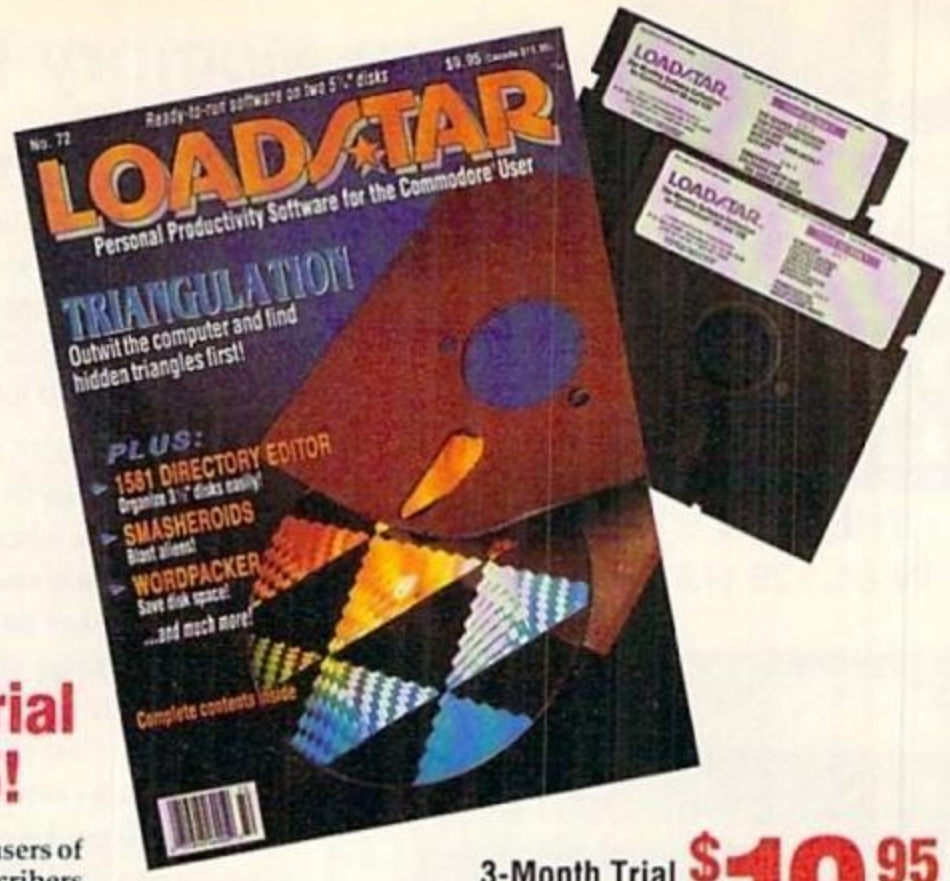

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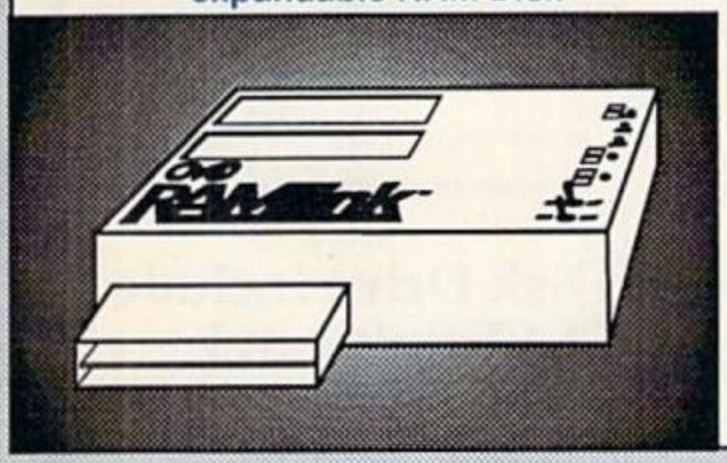

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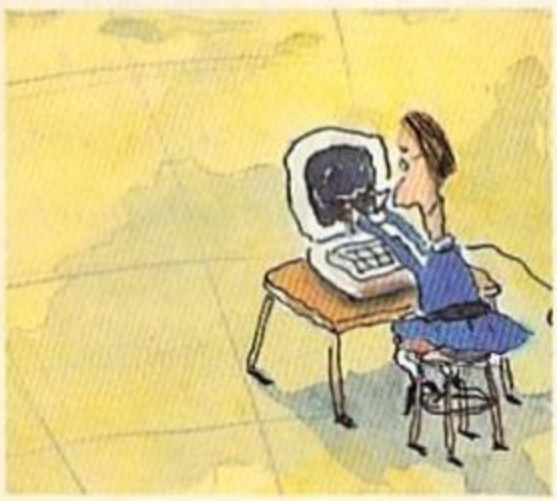

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RUNning Ruminations

You remember those dreamy predictions of over a decade ago that depicted a world in which computers were to be our constant companions in work, play and study, and generally make our lives easier and more enjoyable.

Quite frankly, prognosticators were premature in their forecasts. The computer revolution fizzled. Most consumers are still in search of a compelling reason to buy a home computer. Let's face it: It may sound heretical, but there's nothing you can do with a computer that can't be done some other, cheaper, way.

You don't have to be a technophobe to be threatened by computers and the prospect of purchasing one. High costs, difficulty of use and the many options consumers face are intimidating factors that account for the failure of computers to attain celebrity status.

Computers should allow us more time to do other, non-computer-related activities.

The main reason, however, is that the industry has failed to convince the public that computers will make a significant improvement in the quality of their lives—in entertainment, productivity, education. Consumers need to see that computers can improve their efficiency and serve as the solution to practical problems.

Noted computer author, Peter McWilliams, in *The Personal Computer Book*, makes the point that "computers will prove their worth to the degree that they fit into your daily life, not to the degree that you adapt your life to The Computer Age."

RUN doesn't recommend that readers change their lives to accommodate computers. Rather, computers should be used to allow us more time to do other, non-computer-related, activities.

Computers are wonderful tools to make our lives easier. *RUN* readers are aware of this, and, for the most part, are engaged in productive applications with their systems—word processing, managing home budgets, helping kids learn or just enjoying a good game.

Another useful application for your Commodore is making money, which is the subject of this month's feature article. There are many ways you can "cash in"—well, maybe not by making tons of money, but certainly by supplementing your income—and, at the same time, make life easier for your "client."

Consider the small business whose financial records are in a state of disarray. Also, the restaurant owner who needs help preparing menus. Your Commodore is the solution in each case. Keeping track of customers, maintaining mailing lists, writing articles, publishing newsletters, cards, banners or whatever. Your Commodore is ideally suited to handle these tasks.

RUN also features in this issue a program, written by a professional realtor, that will analyze the cost of home ownership and help you determine whether or not you'll qualify for a loan. A real-life situation that many have faced, and your Commodore can help.

Freeing up people's time from otherwise complex or tedious tasks. That's the promise of computers. And as long as this message is muffled, the computer revolution will continue to flounder.

Dennis Brisson

Dennis Brisson
Editor-in-Chief

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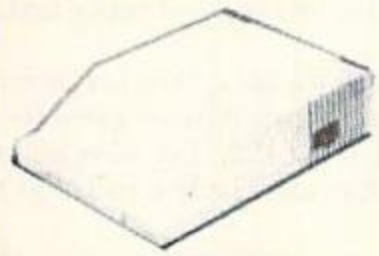

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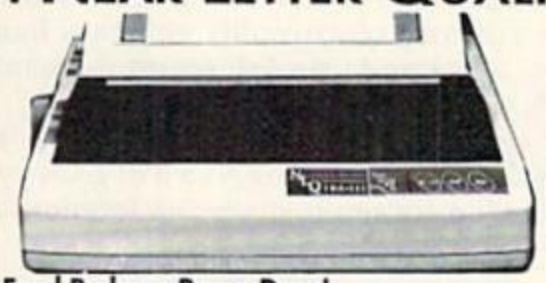

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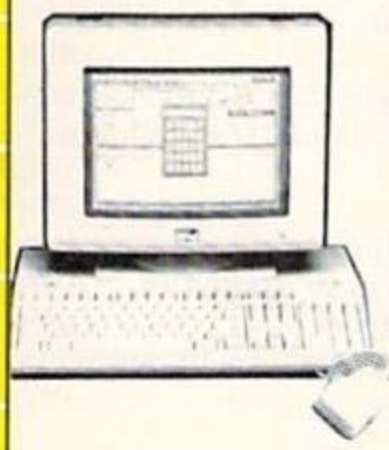

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MAGIC

Quickly find information concerning memory locations and RAM, and create a shutter effect on your screen.

By TIM WALSH

$5AC TEXT INTO GRAPHICS 64

With my program, Text Into Graphics 64, and the SYS 49152 command, you can instantly copy an entire text screen to a graphics screen.

The program reads each character on the text screen and its specific character data, and copies it to the graphics screen at memory locations 8192 to 16192. I've also included a demo routine to show the characters before and after they're copied.

```
Ø REM COPY TEXT TO GRAPHICS 64 - JAY TAPLI
  N                                    :REM*58
1Ø FORJ=49152TO49278:READA:POKEJ,A:NEXT:A$
  =CHR$(13):B$=CHR$(147)              :REM*237
2Ø DATA 169,24,141,24,2Ø8,169,59,141,17,2Ø
  8,173,14,22Ø,41,254,141,14,22Ø :REM*148
3Ø DATA 165,1,41,251,133,1,169,Ø,133,251,1
  33,253,169,4,133,252,169,32,133:REM*136
4Ø DATA 254,16Ø,Ø,169,Ø,133,76,177,251,133
  ,75,24,6,75,38,76,6,75,38,76,6  :REM*42
5Ø DATA 75,38,76,165,76,1Ø5,2Ø8,133,76,177
  ,75,145,253,2ØØ,192,8,2Ø8,247  :REM*141
6Ø DATA 24,165,253,1Ø5,8,133,253,165,254,1
  Ø5,Ø,133,254,24,165,251,1Ø5,1   :REM*38
7Ø DATA 133,251,165,252,1Ø5,Ø,133,252,2Ø1,
  7,2Ø8,188,165,251,2Ø1,232,2Ø8  :REM*218
8Ø DATA 182,165,1,9,4,133,1,173,14,22Ø,9,1
  ,141,14,22Ø,96                  :REM*78
1ØØ PRINTB$"CREATE TEXT FOR THE GRAPHICS S
  CREEN ON{2 SPACEs}THE TEXT SCREEN ";
                                  :REM*254
11Ø PRINT"AND WITH SYS 49152, IT{2 SPACEs}
  IS COPIED TO THE GRAPHICS SCREEN."
                                  :REM*61
12Ø PRINTA$A$A$A$                 :REM*14Ø
13Ø PRINTCHR$(145)" PRESS A KEY TO COPY SC
  REEN":IFPEEK(197)=64THEN13Ø     :REM*11
14Ø SYS49152:PRINTB$;:FORJ=1TO12  :REM*14Ø
15Ø PRINT"PPPPPPPPPPPPPPPPPPPPPPPPPPPPPP
  PPPPPPPP";:NEXT                 :REM*87
```

—JAY TAPLIN, HAMPDEN, ME

$5AD PAUSE BUTTON 64

Pause Button 64 is designed to pause the execution of any program at the press of a key—plus pause the output of a listing to a screen or printer!

After typing in Pause Button 64 and saving it to disk, run it to activate it. To pause any operation, press the F1 key. Pressing F1 again resumes the operation. The program is relocatable to any area in memory not occupied by another program.

```
Ø REM REM PAUSE BUTTON 64 - DOUG MCMARTIN
                                  :REM*84
1Ø FOR I= Ø TO 57:READ A:CK=CK+A:POKE 679+
  I,A:NEXT                        :REM*232
2Ø IF CK <> 6323 THEN PRINT"ERROR IN DATA.
  .":END                          :REM*175
3Ø PRINTCHR$(147)"PRESS F1 TO PAUSE & RESU
  ME.":SYS 712                    :REM*81
4Ø DATA 32,228,255,2Ø1,133,2Ø8,7,32,228,25
  5,2Ø1,133,2Ø8,249,1Ø8,16Ø,3     :REM*95
5Ø DATA 234,12Ø,173,16Ø,3,141,2Ø,3,173,161
  ,3,141,21,3,88,96,173,2Ø,3      :REM*48
6Ø DATA 141,16Ø,3,173,21,3,141,161,3,12Ø,1
  69,167,141,2Ø,3,169,2,141,21    :REM*142
7Ø DATA 3,88,96                   :REM*245
```

—DOUG MCMARTIN, GREEN VILLAGE, NJ

$5AE ZPAGER 64

When using the FRE function (PRINT FRE(0)) to see how much free RAM is remaining on the C-64, you see a negative number. To alleviate this problem, I wrote ZPager 64. Not only does it operate concurrently with most Basic programs, it also does a lot more than just report the actual amount of free RAM.

ZPager works in both Direct and Program modes. After activating ZPager 64, entering SYS 820 gives you the following information concerning memory locations and RAM:

TXTTAB—Start of Basic text memory
VARTAB—Beginning of Basic variables
ARYTAB—Beginning of arrays
STREND—The end of arrays + 1
FRETOP—Bottom of string memory
FRESPC—Utility string pointer
MEMSIZ—Highest Basic address
FREE—Amount of unused RAM remaining

```
Ø REM ZPAGER 64 - MICHAEL MYERS    :REM*118
1Ø FOR T=82Ø TO 98Ø:READ D:POKE T,D:CK=CK+
  D:NEXT                           :REM*13
2Ø IF CK <> 14451 THEN PRINT"ERROR IN DATA
  ...":END                         :REM*178
3Ø PRINTCHR$(147)"Z PAGER ACTIVE":PRINT"EN
  TER SYS 82Ø TO ACTIVATE"         :REM*42
4Ø DATA 32,125,179,169,Ø,133,251,169,141,3
  2,114,3,169,15Ø,32,114,3,169     :REM*245
5Ø DATA 159,32,114,3,169,168,32,114,3,169,
  177,32,114,3,169,186,32,114,3    :REM*64 ►
```

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```
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   3Ø,171,56,165,51,229,49,17Ø     :REM*148
7Ø DATA 165,52,229,5Ø,184,8Ø,18,16Ø,3,32,3
   Ø,171,164,251,23Ø,251,23Ø,251   :REM*187
8Ø DATA 185,43,Ø,17Ø,185,44,Ø,32,2Ø5,189,1
   69,13,32,21Ø,255,96,84,88,84    :REM*2Ø7
9Ø DATA 84,65,66,58,32,Ø,65,82,89,84,65,66
   ,58,32,Ø,86,65,82,84,65,66,58    :REM*16
1ØØ DATA 32,Ø,83,84,82,69,78,68,58,32,Ø,7Ø
    ,82,69,84,79,8Ø,58,32,Ø,7Ø,82 :REM*223
11Ø DATA 69,83,8Ø,67,58,32,Ø,77,69,77,83,7
    3,9Ø,58,32,Ø,7Ø,82,69,69,32,32 :REM*35
12Ø DATA 58,32,Ø                    :REM*155
```

—MICHAEL MYERS, BEARDSTOWN, IL

$5AF More 1581 Hidden Messages

Magic trick $59F in the August/September 1990 issue of *RUN* revealed two hidden messages buried in the Commodore 1581 disk drive's ROM. My program, More 1581 Messages, which works in both 64 and 128 modes, reveals that there are three other messages at locations $DC01, $D00D and $D549, respectively. The last two messages are a tribute to the smaller size and increased efficiency of the 1581's DOS.

```
Ø REM THREE MORE 1581 MESSAGES - HENNING V
  AHLENKAMP                          :REM*36
1Ø C=55:C$=CHR$(13):E$="{CRSR DN}":M$="M-R
   ":OPEN 1,8,15:REM CHANGE 8 TO DEVICE #
                                      :REM*138
2Ø PRINT#1,M$ CHR$(1) CHR$(C*4) CHR$(C)
                                      :REM*15Ø
3Ø FOR I=1 TO C:GET#1,V$:M1$=M1$+V$:NEXT
                                      :REM*99
4Ø PRINT#1,M$ C$ CHR$(2Ø8) CHR$(49)
                                      :REM*183
5Ø INPUT#1,M2$                        :REM*166
6Ø PRINT#1,M$ CHR$(73) CHR$(213) CHR$(15)
                                      :REM*224
7Ø INPUT#1,M3$                        :REM*191
8Ø PRINTE$ M1$ C$ E$ M2$ C$ E$ M3$:REM*137
9Ø CLOSE1                             :REM*93
```

—HENNING VAHLENKAMP, MATAWAN, NJ

$5B0 1571 Messages for the 64/128

If you don't own a 1581 disk drive, you can still find some hidden messages within your 1571. My short 1571 Messages program reveals some information about the developers of this disk drive. The second message, a copyright, is present only in version 5 of the 1571 ROM chip. Drives equipped with earlier versions of the ROM chip will not print the second message.

As with the above example, the 1571 messages can be revealed from either 64 or 128 mode.

```
Ø REM 1571 SECRET MESSAGES - HENNING VAHLE
  NKAMP                              :REM*159
1Ø CR$=CHR$(13):M$="M-R":OPEN1,8,15
                                     :REM*222
2Ø PRINT#1,M$ CHR$(2)CHR$(128)CHR$(46)
                                     :REM*199
3Ø FOR I=1 TO 46                     :REM*248
4Ø GET#1,V$:M1$=M1$+V$:NEXT          :REM*25
5Ø PRINT#1,M$ CHR$(1)CHR$(192)CHR$(55)
                                     :REM*32
6Ø FOR I=1 TO 55                      :REM*4
7Ø GET#1,V$:M2$=M2$+V$:NEXT          :REM*1Ø9
8Ø PRINT CR$ M1$ M2$:CLOSE1          :REM*189
```

—HENNING VAHLENKAMP, MATAWAN, NJ

$5B1 Color Shutter 64

My program, Color Shutter 64, creates a shutter effect. When you run it, you'll see how the border and screen colors change at the press of a key.

Rather than simply change colors, a small animation routine "rolls" lines of color onto the screen, much like window shutters opening. The result is an effect unlike any other you've seen on a C-64. Use it to add spice to otherwise dull programs.

```
Ø REM COLOR SHUTTER 64 - RICHARD PENN
                                     :REM*57
1Ø FOR T=918 TO 1Ø15:READ D:POKE T,D:CK=CK
   +D:NEXT:POKE 955,2ØØ              :REM*42
2Ø IF CK<>14161 THENPRINT"ERROR IN DATA...
   ":END                             :REM*222
3Ø DATA 32,241,183,142,252,3,32,241,183,14
   2,253,3,173,32,2Ø8,141,254,3      :REM*84
4Ø DATA 173,33,2Ø8,141,255,3,169,Ø,141,14,
   22Ø,173,18,2Ø8,2Ø1,Ø,2Ø8,249     :REM*194
5Ø DATA 169,2ØØ,141,25Ø,3,169,1,141,251,3,
   174,254,3,172,255,3,142,32        :REM*219
6Ø DATA 2Ø8,14Ø,33,2Ø8,174,25Ø,3,234,2Ø2,2
   Ø8,252,174,252,3,172,253,3,142 :REM*154
7Ø DATA 32,2Ø8,14Ø,33,2Ø8,174,251,3,234,2Ø
   2,2Ø8,252,238,251,3,2Ø6,25Ø,3     :REM*64
8Ø DATA 2Ø8,21Ø,169,1,141,14,22Ø,96
                                     :REM*157
9Ø PRINTCHR$(147)TAB(6)"DYNAMIC SCREEN COL
   OR CHANGER"                       :REM*245
1ØØ PRINTTAB(12)"{2 CRSR DNs}BY RICHARD PE
   NN"                                :REM*Ø
11Ø PRINTTAB(8)"PRESS A KEY TO CONTINUE"
                                     :REM*3Ø
12Ø SYS 918,Ø,Ø                      :REM*172
13Ø WAIT 198,1:GETA$:X=X+2:IF X>14 THEN X=
   Ø                                 :REM*84
14Ø SYS 918,X,X+1:GOTO 13Ø           :REM*246
```

—RICHARD PENN, MONTREAL, QUEBEC, CANADA ■

Magic is a forum for RUN*'s imaginative and inventive readers to share their programming tips, brief software or hardware modifications, shortcuts or items of general interest. If you have an idea to make computing easier, faster, more exciting and enjoyable, send it to: Magic, RUN Magazine, 80 Elm St., Peterborough, NH 03458.*

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News and New Products

Read about a new newsletter for the C-64/128, compete in 28 different sporting events, and create animated cartoons.

By HAROLD R. BJORNSEN

Learn Math

PORTLAND, ME—**Logo Math**, from Terrapin Software (400 Riverside St., Portland, ME 04103), is a complete math lab for the secondary math curriculum. It contains 14 programs to help students in grades 6–12 investigate math, and it requires the use of Terrapin Logo (not included) on the C-64. A single copy is $39.95; a site license is $99.95.

Extra! Extra! Read All About It!

BERWYN, IL—***Micro-Bytes*** is a new newsletter for the C-64 and C-128. It offers several features, including Tech Trek, for hackers; The Joy of Gaming, which lists hints, tips and new products for game lovers; Q&A, a question-and-answer column; Editor's Notes, where the editor speaks out; geoBytes, an update on GEOS; plus several other sections. The newsletter is published quarterly, and each issue costs $2. Subscriptions are also available. For more information, send an SASE to Micro-Bytes, 2648 S. Kenilworth, Berwyn, IL 60402.

28 in One

REDWOOD CITY, CA—Epyx (PO Box 8020, Redwood City, CA 94063) is releasing its **Epyx Game Series** in one package for the C-64. The series consists of California Games (with such events as Skateboarding and BMX Biking), World Games (which includes Caber Tossing and Sumo Wrestling), Summer Games II (with sports like Kayaking and Fencing) and Winter Games (Biathlon Skiing and Bobsledding). The package contains 28 different events and is available for a limited time only. $34.95.

What Word Describes This Picture?

SAN RAFAEL, CA—Broderbund Software (17 Paul Drive, San Rafael, CA 94903) has released the board game, **Pictionary**, for the C-64. The game is played by drawing (either by computer or human) a picture on the screen, and then guessing the word it represents. One to four players or two to four teams may play at one time. The package retails for $29.95.

Can you identify this bird? Guessing is part of the game in Pictionary.

Find the Prism of Hehuetotol

SAN MATEO, CA—In **Questmaster, The Prism of Hehuetotol**, you must find the crystal prism of Hehuetotol, a vital piece that will help conquer the evil lord Colnar. Your adventure begins in a magical world, with over 100 original pictures and over 30 animated scenes. Of course, you must battle an assortment of ferocious foes and get help from friendly characters. It's available for the C-64 for $34.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404.

A New PBS Series

SAN RAFAEL, CA—Broderbund Software, WGBH Boston and WQED Pittsburgh are developing a game show for the Public Broadcasting System based on Broderbund's adventure detective-chase computer game, Where in the World Is Carmen Sandiego?. The television program is planned for national broadcast on PBS in the fall of 1991, as a Monday through Friday half-hour game show that will promote geographical literacy.

"This is the first time a software character has been used as a basis for a television game program," said Ed Auer, Broderbund's president. "The Carmen Sandiego series fits naturally with public television.... I think television audiences will feel challenged to outguess the contestants."

Three in-studio teams of contestants will race to recover an exotic treasure swiped by the infamous Carmen Sandiego, then try to capture Carmen herself. To ferret out Carmen and the loot, the detective teams must compete by answering geography-related questions and deducing locations from clues disclosed on the electronic game board.

Make Menus, Intros, etc.

MEDFORD, OR—AccuTone Productions (36 Myers Court, Medford, OR 97501) introduces **Screen-Pro**, a screen and animation production system for the C-64. With it, you can create menus, displays, intros, game backgrounds, cartoons, video credits, and so on. The system's many features include the ability to create animation with up to 34 successive screen frames or with up to 17 frames, using full-color and color mode combinations. $24.95.

Joystick Stand

WARWICK, RI—**The Stik-Gripper Total Control Stand** is a three-piece plastic stand that you can mount your joystick on and place on your chair. Putting your legs over the base of the stand holds it in position, while your joystick is clamped in front of you, right where you need it. It's available for $19.99. Duggan DeZign Inc., 300 Quaker Lane, Suite 7, Warwick, RI 02886.

C-128 Finances

LILBURN, GA—Bremer Systems (4242 Collie Court, Lilburn, GA 30247), a newly formed company dedicated to the development of C-128 software, introduces **System 6**, a complete system for the management and control of personal finances. The 80-column, totally menu-driven program balances all accounts, lets you budget expenses and forecast income, and automatically performs all accounting functions. $39.95 plus $4 s/h. ■

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MAIL RUN

A 64-produced newsletter wins first prize. And, C-64 software to match power of PC software?

BLOWING AWAY THE COMPETITION

We publish the official newsletter of the National Association of Rocketry, Headquarters Astro-Modeling, *ZOG Forty-Three*. It is written on a C-64, using GEOS 2.0, geoPublish and a 1541-II disk drive. The master copy of the newsletter is printed out from a Star Micronics NX-1000C printer.

Our newsletter was recently selected by the National Association of Rocketry to receive the Rockwell International Trophy for best newsletter for the 1989–1990 contest year. *ZOG* was up against newsletters from across the country. Many were published on IBMs, Apples and other brands of computers. Some were printed on laser printers, some used offset printing. Yet, with all of this, we came out on top. I think this says a lot about our little computer.

—ROBERT W. AUSTIN
WASHINGTON, DC

THE C-64 AND THE GENLOCK

I am an independent video consultant who designs video equipment. Recently, a customer asked me to design an interlace-genlock box (a device for capturing images) for the 64C. For the customer's application, this made more sense than an Amiga with genlock. I completed the original prototype to my customer's specifications and later added VCR input with overlay capability.

I am considering offering the 64C interlace-genlock box as a product. It would have to sell for about $700 built and tested, or about $400 as a kit.

However, first I need some marketing input from your readers concerning the following: Does anyone else have a need to obtain legal, broadcastable NTSC video from the 64? Is there a need to synchronously mix the 64's output with other video sources? Is this product already available elsewhere? Aside from current computer prices, are there any other advantages of a 64 with genlock over an Amiga with genlock?

I'd appreciate any comments. Readers can write to me at 9100 West Evans Creek Rd., Rouge River, OR 97537, or phone me at 503-582-4137.

—BILL HERZOG
ROGUE RIVER, OR

MATCHING PC POWER

Clive Electronics has decided to reestablish interest in the C-64 by developing a new line of software that will include word processing, desktop publishing, spreadsheet and database programs that match the power found only on software for IBM-compatible PCs.

The software will be designed for use with a hard drive, accelerator cartridge and the 512K expansion unit. To help us make decisions on features to incorporate in the software, we would like your readers to drop us a line at Clive Electronics, 2936 34th Ave. S., Minneapolis, MN 55406-1708. We cannot, however, answer individual letters.

—KENNETH CLIVE
MINNEAPOLIS, MN

COMMODORE CLINIC BOO-BOOS

In your answer to Evelyn Babineau's question in Commodore Clinic (*RUN*, June/July 1990) about producing a newsletter on the C-64, Ellen Rule stated that she should start small and paste pictures on a newsletter printed with a word processor. This is insane! As my college computer science instructor is fond of saying, "Don't reinvent the wheel." To tell her to do something this primitive on a 64 is absolutely ludicrous, because Springboard Software produced a fabulous program for making magnificent newsletters complete with graphics. It's called Newsroom and was a best-seller. So, please do some research for these novices instead of telling them to start small.

—JON BECKMON
JEROME, ID

The two publishing programs we mentioned, PaperClip Publisher and geoPublish, are much more readily available than is Newsroom. However, you're absolutely correct. Newsroom is just what this user needs—if she can find it. At least one major mail order company has it advertised as a bargain-basement special.

—EDITORS

Jim Timberlake of Fort Myers asked Commodore Clinic (March 1990) how to merge datafiles. The method you suggest is a generic process that works with many sequential files but will not work with datafiles, because the first field in the merged datafile will show an incorrect number for the total possible records in the file, and the third field will not show the correct number of records in the merged file.

A better answer is to use DFMerge, which was written by Mike Konshak, the author of Datafile, who also wrote a number of companion programs that can be used to manipulate datafiles in various ways.

I use Datafile and its companion programs constantly, and have found it, along with RUN Calc, to be the ideal combination for all my home finance recordkeeping.

—SI LABAR
BETHLEHEM, PA

S.A.M. SPEAKS

I was a ventriloquist for three years, but swollen joints and tendon problems stopped me from going any further.

I am currently trying to find a Software Automatic Mouth (S.A.M.) program that I can use on my C-64 to speak words, speeches, sentences, songs, games and other programs, and to change voices. By mixing the computer's voices and my ventriloquial experience, I feel that I can help children through storytelling on cassettes.

—DAVID SPAULDING
MARIETTA, NY

We suggest that you contact Busy Bee Software (PO Box 2959, Lompoc, CA 93438) for a copy of their BB Talker program, which includes S.A.M.

—EDITORS ■

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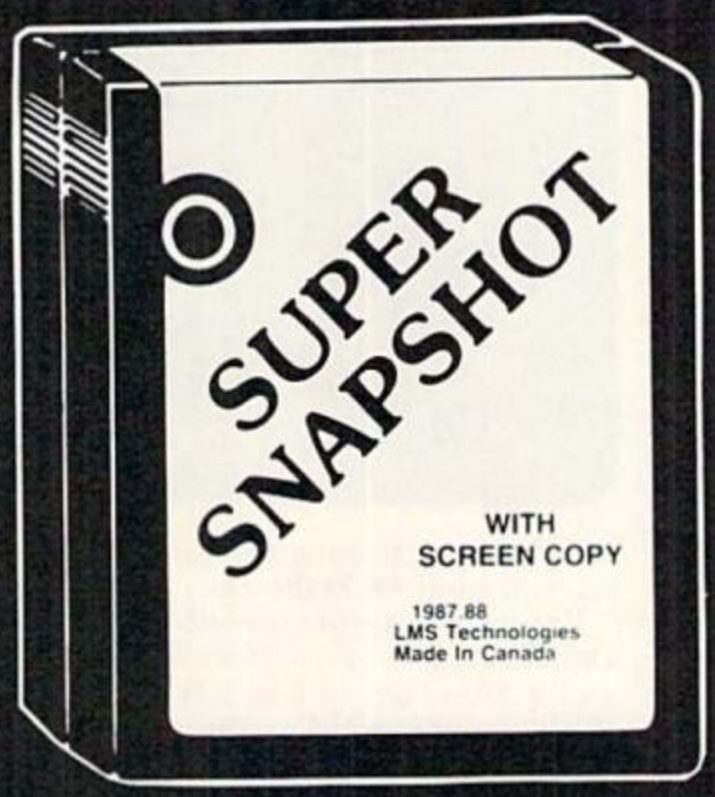

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SOFTWARE GALLERY

December brings reviews to fulfill the Christmas wish lists of 128 owners, 3-D fans, dream analyzers and more!

By BETH S. JALA

BEYOND THE BLACK HOLE ..... A

3-D Comes to the Computer Screen

Just when you thought you'd seen your last Breakout clone, along comes Beyond the Black Hole to prove, once again, that an old dog can be taught new tricks.

Unlike most other hit-the-brick games, which have a horizontally moving paddle on the bottom of the screen with the bricks on top, BTBH employs two vertically moving paddles, one on each side, with the targets in the center.

The ball is a space orb used to map and investigate a quadrant of the galaxy. Constantly moving from side to side, its direction is determined by the angle at which it hits the paddle. When the orb hovers over an object, pressing the joystick button eliminates a "brick" or effects some change upon it.

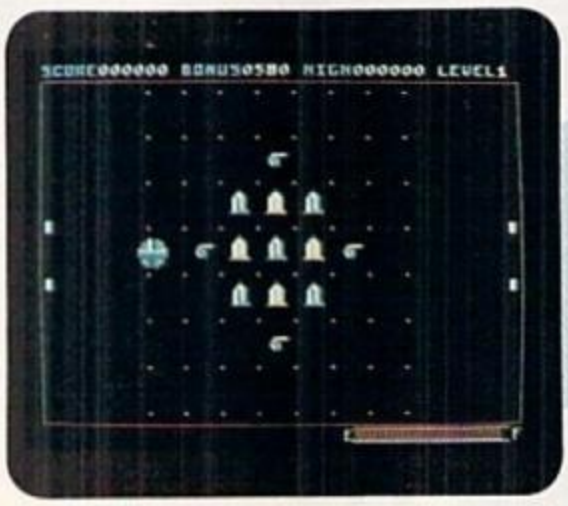
The center of the screen represents the Black Hole. In the 35 game levels, you'll discover a remarkable array of "bricks"—everything from killer tomatoes to bagels and lox. To complete some screens, you must eliminate all the objects, while other screens contain a puzzle to solve.

The program, I'm happy to say, contains both a save game and continue game feature, which makes it possible for you to complete most—if not all—of the levels.

Fuel runs down rapidly if the orb gets past a paddle and flies off the side of the screen or if a fuel pirate captures you. Successfully evading these star-like nemeses earns you a second orb. Unfortunately, maneuvering two orbs for more than a few seconds is virtually impossible.

For additional fuel, you must travel to the fuel depot and fly into one of the fuel pods, which is no easy task. Also, a fill-up costs 1000 credits and causes your paddles to shrink.

The paddles are controlled quite responsively by joystick, keyboard or mouse. Options, such as traveling to the fuel depot or pausing the game, are accessed easily via keyboard.



Take a look at level one of Beyond the Black Hole: Can you make it to 35?

By constantly keeping the orb moving and changing size, the authors have created a 3-D effect. In fact, 3-D glasses, although not essential to play, are provided to enhance your viewing pleasure.

Another asset is a well-written booklet that includes scientific information about 3-D—its use in still photography, motion pictures and comics—and classic 3-D photos, which can be viewed through a set of 3-D reading glasses (also furnished).

With new design elements, challenging and varied game play and excellent documentation, the makers of Beyond the Black Hole have taken something very old and, out of that, fashioned something very new. *(The Software Toolworks, 60 Leveroni Court, Novato, CA 94949. C-64/$29.95.)*

—LEN POGGIALI
SYRACUSE, NY

REPORT CARD

A Superb!
An exceptional program that outshines all others.

B Good.
One of the better programs available in its category. A worthy addition to your software library.

C Average.
Lives up to its billing. No major hassles or disappointments here.

D Poor.
This program has some problems. There are better on the market.

E Failure.
Many problems; should be deep-sixed!

WEIRD DREAMS ..... B+

Try Interpreting This Dream!

Perhaps the best way to describe Weird Dreams is to say that it is the product of a fevered imagination. Still, that only hints at the game's absurdities and doesn't reveal any of its wit and charm. Furthermore, that might not cause you to rush out and purchase this game, which is something you should do, posthaste.

Weird Dreams is a British import that amply demonstrates the differences between British and American humor. The action is of life and death importance, but the course through which you must navigate is odd, even by British standards.

A lot of the preliminary action takes ►

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place in the well-written novella that accompanies the game. The real action, however, starts when you boot the game and find yourself, in your pj's, trapped at the bottom of a huge cotton candy machine. If you manage to escape, you'll be attacked by a giant killer bee. And if you get past the bee, you'll land in a house of mirrors that leads you to a desert (complete with flying fish), a rose garden (with man-eating roses), or back into the cotton candy machine.

Fear not, however, for you're provided with weapons: a stick, an electric eel or one of those flying fish. You'll also be menaced by quicksand, two-legged totems, huge Easter Island-like heads, a ballerina and an enormous brain with one eye. In addition, you must wend your way through an oversized piano, grandfather clock, the fairgrounds, a swamp and the aforementioned desert. That's just for starters!

A clue book is provided with the software. Each clue has a dollar amount attached to it, and you are honor-bound to keep track of how much you spend in your attempt to survive this journey. Upon completion of the game, you add up the dollar amounts to determine the degree of your psychosis. The outcome can range from "Hopelessly well-adjusted" ($0–$50) to "Shock treatments mandatory. Could you please pay your bill in advance?" ($995 and up).

If all this sounds just a mite bizarre, it certainly is, but keep in mind the title of this madcap little jaunt through the id. Offbeat does not begin to describe this British import, and I guarantee that you'll feel more than just a tad silly thrashing the head-biting totems with a fish. Still, it's all in good fun, and the life you save will be your own. So don't wait, pick this one up, and have a Weird Dream of your own. *(MicroPlay; distributed by MicroProse Software, 180 Lakefront Drive, Hunt Valley, MD 21030. C-64/$29.95.)*

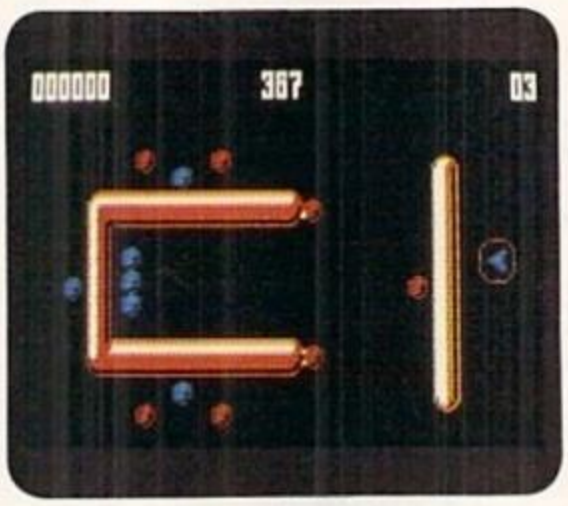
—Bob Sodaro
Fairfield, CT

The Game of Harmony .... B+

Remaining Calm is the Challenge of This New Age Arcade Game

The Game of Harmony is reminiscent of many early arcade games. It's easy to learn, difficult to master and wonderfully addictive. Where Harmony differs from the other arcade offerings, however, is in its nonviolent approach. Instead of recklessly blasting away at your enemies with a laser pistol, your goal in Harmony is to clear each screen by bringing similarly colored floating spheres together. As the spheres disappear, they create synergy and help to "harmonize" the current level.

Each of Harmony's 50 levels presents a different configuration of pulsating spheres for you to harmonize. You push the colored spheres around with your own joystick-controlled sphere, called a seeker. The seeker is a lot like an unarmed version of the spaceship from the arcade favorite, Asteroids.



Try to "harmonize" this level in The Game of Harmony.

As you play Harmony, the rate at which the colored spheres pulsate increases. If they're not harmonized within a short time, they explode and, in the process, drain energy from your seeker. To complicate matters, dissimilar spheres are often tied to one another or to your seeker by elastic connectors. In addition, many levels have colorful barriers that must be circumnavigated. Fortunately, all spheres, including your seeker, can leave one side of the screen and wrap to the opposite side.

Bringing different colored spheres together creates small spheres called pods which can be gobbled up with your seeker to increase its energy supply. If you fail to reach the pods in time, they grow into full-size spheres, which must be harmonized in the usual manner.

Thus, while it's usually a bad idea to push dissimilar spheres into one another, sometimes you can rack up a lot of points and maintain a healthy energy supply by creating as many pods as possible and gobbling them as fast as you can.

Harmony can be played by one or two players using joysticks, the keyboard or some combination of the two. In the Two-Player mode, each player controls his own seeker and must cooperate with his partner to harmonize the level.

For those of you who have enough pressure in your lives, Harmony even offers a Mantra mode which lets you casually work your way through all 50 levels with no time limits or energy supplies to worry about, and spheres that are just too pooped to pulsate. *(Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. C-64/$29.95.)*

—Bob Guerra
Charlestown, MA

Maidstone Quest ..... B

Here's an Exclusive Graphic Adventure For 128 Owners

Maidstone Quest is that rarest of commodities—a game designed specifically for the Commodore 128D or for the earlier C-128 with 64K RAM upgrade. In addition, it was written in Basic 8 and may be viewed only on an 80-column RGB color monitor.

While it was courageous of Silvasoft to market a product whose hardware requirements will limit sales, the game itself is standard fare. Billed as an animated graphic adventure, Maidstone Quest sends you through 28 levels of danger in search of an evil necromancer and the stone he has purloined.

As you journey forth, you'll discover weapons, keys, scrolls, secret messages, potions and gold. You'll also encounter helpful and bloodthirsty creatures. The former will supply information in return for a reward, while the latter will do their best to kill you.

Dispatching most of your foes is an easy matter, assuming you have weapons available in your inventory. You simply select Fight from the menu and choose either a knife, ax or sword. Then you sit back and watch as Rodney, your on-screen figure, does the dirty deed. Without the proper weapon, you suffer defeat and the loss of health points or your life.

Many obstacles won't be overcome by brute force. There are doors and chests to unlock, spells to cast and ancient runes to decipher. Some problems may be solved only by combining certain items in the proper order.

Most commands are chosen by joystick or mouse. Selecting the appropriate direction on your on-screen compass and pressing the joystick or mouse button moves your character.

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Other options, including Search, Examine, Drop, Take and Spellcast are accessed from a pair of scrolls, often in combination with an object from the inventory area. You can save to disk as many as ten games in progress.

The musical score is melodic and evokes the atmosphere of the game's medieval, cavernous setting. Graphics are distinct and varied, and animation is smooth and nicely paced. To the author's credit, the game plays more like a machine language program than one written in Basic.

Despite the mundane theme and the rudimentary nature of combat, Maidstone Quest will provide adventure lovers with many hours of enjoyment mapping its extensive world, searching for treasure and discovering solutions to problems. Silvasoft's maiden quest on the C-128 was worth the effort. *(Silvasoft, PO Box 1006, Charlotte, VT 05445. C-64/$25 plus $3.50 shipping and handling.)*

—LEN POGGIALI
SYRACUSE, NY

AT A GLANCE

PRO TENNIS TOUR ..... C–

Calling Pro Tennis Tour the "ultimate tennis simulation" goes beyond the bounds of industry hyperbole. Unfortunately, the game is more notable for what it lacks than for what it contains.

Gone are the player and rank editors, the table of match results, the instant replays and the time penalties—all listed in the manual but missing from the C-64 version. The most critical omission is the lack of a save/load option: To complete this tour in one sitting requires an enormous time commitment.

Pro Tennis' music and sound effects are minimal. Animation is graceful, but the graphics are unclear. Against the computer, you control the player in the foreground, but unlike many similar programs, players don't switch sides between games.

You execute most shots, including the net shot, volley and down-the-line shot, by correctly positioning your player and pressing the firebutton. Smashes and lobs require joystick movement after the button is pushed. Because of the speed at which the computer opponent hits the ball, it will take some time before most human players are able to set up these returns successfully.

Your computer opponents all play a similar game within each difficulty level. Also, despite reports to the contrary, it is easy to ace on nearly every serve. Exploiting this programming flaw makes victory possible, even against the most formidable adversary.

As a back-and-forth test of hand-eye coordination, this game serves nicely. As an "ultimate tennis simulation," however, Pro Tennis Tour doesn't even clear the net. *(UBI Soft; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95.)*

—LEN POGGIALI ■

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HOW TO MAKE $$$ WITH YOUR COMMODORE

INSIDE EVERY COMMODORE there are greenbacks longing to be free. Getting them out requires some thought and work, but over the years, your computer system can pay part, or even all, of its cost—and then some.

If you want to generate some cash with your computer, don't set your goals too high, or you'll quickly be discouraged. There's a difference between making a living and earning extra spending money. You might make enough to buy a new program or a second disk drive, but it's unlikely you'll cover a mortgage payment on your first try.

To come up with an idea for making money with your computer, think about what you like to do with it. What are your computing strong points? Do you know how to fix computers? Or are you better at using them? Can you teach others to use a computer?

Tell Me About It

To some, the Commodore operating system is tricky to learn and use. If you're an experienced user, you might be able to sell your knowledge to others so they can use their computer to the fullest. If you want to help new users, you might print up leaflets that describe your teaching offerings and ask your local Commodore dealer if you could leave them at the store as handouts.

Prospective students can also be found at the nearest Commodore users' group. Most group members are willing to provide free advice to novices, but some new users are glad to pay for private or semiprivate lessons.

In a Fix

Randall Lipham, past president of a Commodore users' group in central Florida, said he's made a few dollars by picking up computers at second-hand shops or bargain stores. After he's cleaned or fixed them, he sells them for a profit. Cleaning is important, he noted, because "you don't get top dollar for a dirty computer."

"I keep a mailing list for a mail order company. In exchange... I get merchandise from the company."

Amateur radio and electronics flea markets are another source of used machines. "These are also good places to find low prices on cast-off software," added Lipham. "What's cast off by one user is another user's find. To a new user, old software is new."

Following Orders

Trading goods for services is just as good as making money for Ellen Rule, one of *RUN*'s contributing editors. "I make money with my Commodore by using it for freelance writing," Rule said. "I also keep a mailing list for a mail order company. In exchange for doing that, I get merchandise from the company."

Getting With the Program

The important thing is to know what selling points you can offer with your knowledge of the computer.

Mark Jordan, a writer and programmer who developed the Brainstorm outline processor for the Commodore several years ago, said the programming market for the Commodore is still there. "It's not like it was when sales of the C-64 were at their peak," he said, "but Loadstar and other disk services are still looking for good programs."

Jordan said programmers can make money if they keep an eye open for potential customers. The trick here is that not all potential customers know they need a programmer. A man who laid out and painted lane marks

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Make your Commodore earn its keep, and earn some extra cash for yourself.

By LONNIE BROWN

for track events was one such person, Jordan noted. "Figuring out those marks is a pretty complicated process, and one teenager developed a program to do all the math involved. It was a simple program, but it saved the man who painted the lanes and starting markers a lot of time."

The nice thing about a Commodore is that it's relatively inexpensive. (At one store, a C-64C and disk drive were priced at under $300.) So, if you develop an application that calls for a computer, the C-64 is an obvious choice. With its user port and an interface, the Commodore can be programmed to run equipment, monitor temperatures, switch lights on or off and do other tasks.

On the Desktop

Money-generating jobs are in lots of places, if you just look for them. GEOS and its family of programs can assist you in a wide range of possibilities in the desktop publishing field. GEOS-created documents can be printed on a laser printer for high-quality results.

"The C-64 is doing things people never imagined it could do," said Paul Hughes. Paul and brother Peter are QuantumLink SYSOPs who keep looking for the outside of the Commodore envelope—but never seem to find it.

Paul noted that GEOS programs let the Commodore support Postscript fonts: "When people see the finished product, they say, 'You did that on a Macintosh or IBM, didn't you?' "

The desktop publishing doors are open. Restaurants might be interested in a service that provides nicely printed three-by-five cards listing daily specials, to replace the handwritten menu notes frequently used to tell customers about the chef 's offerings. GEOS can easily turn out the cards—or a redesigned menu. Showing a restaurant owner a sample of a reworked menu could lead to a sale.

"When people see the finished product, they say, 'You did that on a Macintosh or IBM, didn't you?' "

The Old College Try

While a large number of high school and college students use computers to produce their term papers, many still don't. Or they don't have the time to type from their rough, handwritten notes. A typing service, advertised on campus bulletin boards, is another way of bringing in some income.

"I do a lot of typing for professors," one woman who runs a typing service said. "Many professors I know don't want to learn how to use a computer, or they want the time to do research instead."

Typing services can also provide additional help for people who can type, but who don't have access to high-quality printers or typefaces for producing resumés. One of the best programs for creating nice-looking resumés is Xetec's Fontmaster. It's ideal for producing high-quality fonts in various sizes. Those typefaces can really improve the resumés, term papers and other work where both content and appearance count.

Research and Development

Your Commodore computer can help with research work, too. In the time it takes to find a book in a library, a computer can connect to an online service, search out articles mentioning a specific subject, download the material and send it to a printer. Starting a research service is another way to make your computer system pay for itself. ►

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The Fontmaster program mentioned above (available for both the C-64 and 128) is also good for developing forms and invoices for businesses. In addition, GEOS paint programs can turn out professional-looking forms that can be printed on a laser printer.

Developing applications for GEOS is another possible source of revenue. Massachusetts programmer Joe Buckley has built up a small, one-man company by developing GEOS utility programs. And Arizona's Susan Lamb is noted for the disks of GEOS clip art she's created.

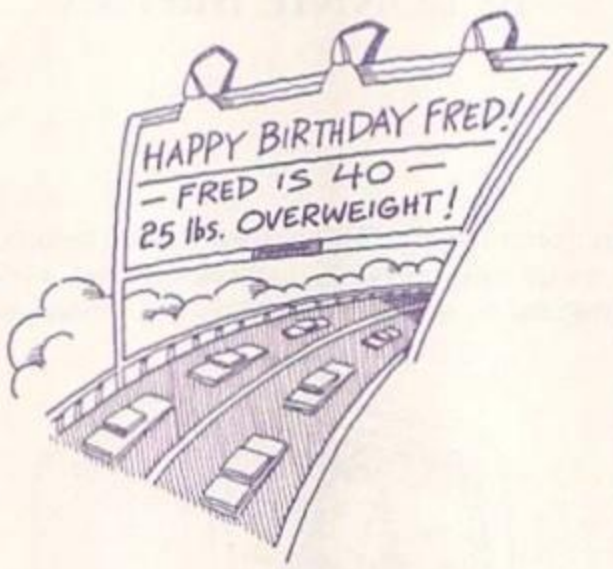
No News is Bad News

Producing a regular newsletter for your church or club is a money-making possibility. Some groups still depend on a typewriter and copy machine to make their newsletters, and the Commodore can make an improvement on those. Of course, nonprofit organizations may not be willing to pay more than expenses, expecting you to volunteer your services.

If they're willing to pay, fine. That's how money is made. Remember: When you're trying to make money with your computer, the only things you have to sell are your time and your talent. Give either away, and you lose money.

The Personal Touch

Russell Sharpe sells his time so others can save theirs. "I make cards, banners, posters and anything else my callers want," said Sharpe, who lives near Atlanta. "I use high-quality colored paper and colored ribbons to turn out attractive finished products. Sure, they're done on a computer, but my work is personalized." A birthday card has the recipient's name and age or other personal information printed on it, he added. "It's something none of the big greeting card companies can do. That's the appeal of it."



Birthday cards can be personalized to include the recipient's name, age and other personal information.

Take a Chance on It

Keeping lottery information in spreadsheet form can come in handy. People will buy lists of past winning numbers or compilations of "hot" or "cold" number lists. Several programs are available for the Commodore to keep track of past winning number sets and project which numbers are "due" for a hit. Use a desktop publishing program to give a polished look to the listings. A clerk at a lottery outlet may be willing to help sell the finished tip sheets.

Tax Yourself

People always need help with taxes. Sometimes, it's best that they seek advice from a professional, but they might need some assistance in finding a program that can help them do their taxes. Or they might need help in learning how to use one.

A few months before the April 15th filing deadline would be a good time to offer a freelance article to a magazine or the local newspaper on what's available for tax preparation.

If you don't want to do taxes, you might want to design spreadsheets for keeping track of income and expenses during the year. Many accountants charge by the hour for tax preparation, and it's quicker for them to search a spreadsheet for figures than it is for them to dig through a shoe box filled with receipts. A well-organized spreadsheet can save money. Even if you don't convince others to use your product, you should be able to shave some off your tax bill through good recordkeeping.

Garage Game Room

As mentioned earlier, time is valuable. One inventive (some might say "Scrooge-like") Commodore owner charges neighborhood kids 25 cents an hour for use of the computer. After all, not all the great games in the world are available for the television game machines that some computer owners sneeringly call "lobotomized computers." So the kids gladly pay (costs less than an arcade machine), and when the end of the month rolls around, there's money in the till to buy a new computer game—and renew the attraction to visit the garage/computer room and pay for the privilege.

Spread the Word

The Hughes brothers (those GEOS mavens mentioned earlier) say that the biggest moneymaker you can purchase for a Commodore is a word processor. "Get a good one," advised Paul Hughes. "You can do a lot with a word processor, such as write an article for a computer magazine or do some typing. The main way to make money with a Commodore is to perform a needed service for someone else."

He added that if you're working for someone who has an IBM-compatible computer, programs like Big Blue Reader can transfer text files from C-64 to IBM format.

Those word processors can really come in handy. Robert M. Mayo of Baton Rouge, Louisiana, recently wrote to say that he uses a word processor as a datafile for keeping genealogy records. "It doesn't restrict me to fixed-dimension fields, and by using the Search function, I can quickly find any item that's in the file." Mayo also earned $5 for sending his word processor tip to *RUN*'s ProTips column.

As I said, you might not get rich using your Commodore, but if you keep at it, the computer can pay its own way. ■

Editor's note: We're sure that there are plenty of RUN *readers making money by employing their Commodores in inventive ways. If you're one of them, we'd like to hear from you.*

Lonnie Brown uses his Commodore to make extra cash by frequently contributing articles and reviews to RUN.

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LET'S FACE IT—MAIL ORDER HOUSES ARE *NOT* ALL THE SAME!

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1990 Holiday Shopping Guide

With the holidays fast approaching, you're probably asking the same question you asked last year: "What do I buy for the Commodore user who has everything?"

The C-64 is approaching its eighth birthday, and most users already have monitors, printers, modems, additional disk drives and shelves bulging with applications and game programs. But there is hope for the gift giver. Following is a list of nifty gifts you can give to the computerist who has "everything." Some of these gifts may seem a bit untraditional, but remember that innovation is the key to gift giving. I've grouped the ideas according to price, from stocking stuffers to those that fit under the tree. Refer to Table 1 for the manufacturers' addresses.

Stocking Stuffers—For $10 or Less

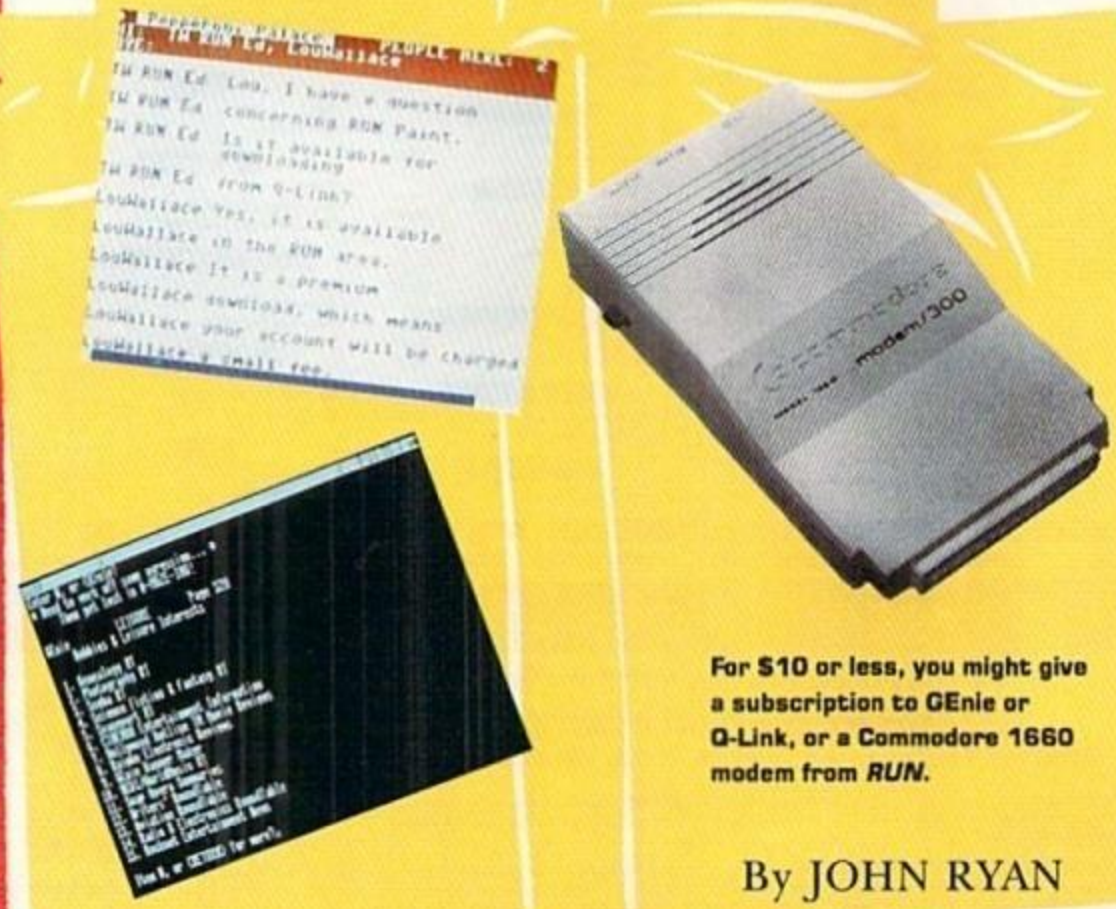
Some things still cost less than $10: a box of floppy disks, a disk drive cleaning kit, a furry little 1351 mouse cover. But why not give a stocking stuffer that will knock your loved one's socks off?

Dreaming of GEnie. For instance, you could add GEnie to his or her telecommunications assets. The General Electric Network for Information Exchange recently announced its Star*Services. For $4.95 a month and no connect charges, modem owners can now enjoy more than 100 GEnie services, including education, games, news and special-interest roundtables. In addition, non-prime-time 300-, 1200- and 2400-baud access to GEnie's software libraries, chat lines, interactive games and other premium services has been reduced from $10 to $6 an hour. To top that off, the $29.95 sign-up fee has also been discontinued.

The Missing Link. For any modem owner who isn't already on Quantum-Link, a subscription to this premier forum for Commodore telecommunications is a must. Q-Link is truly a gift that keeps on giving; for only $9.95 a month, it offers access to hundreds of services, including encyclopedias, massive software libraries and the famous Q-Link People Connection.

Making the Connection. Speaking of telecommunications, you can't get online without a modem. So, as luck would have it, *RUN* is offering a starter kit that makes it easy to enter the exciting world of telecommunications. You'll receive a Commodore 1660 modem (300 baud), the cable to connect to your phone line, all the software you need, as well as introductory free time on Q-Link: All this for only $10!

Music Masters. Digital Arts & Technologies, a leading retailer of MIDI software, offers a definitive resource for the computer music lover in your family. With a $5 subscription, he or she will receive the *Musician's Music Software Catalog*, an annual 96-page guide that provides comprehensive overviews of current music software and MIDI products for all popular computers, including the 64 and 128.



For $10 or less, you might give a subscription to GEnie or Q-Link, or a Commodore 1660 modem from *RUN*.

By JOHN RYAN

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Stuck on an idea? You might consider one of these suggestions.

The Screen E.L.F., the SID Symphony Stereo Cartridge and the Eye-Mate Optical Massage Device can be under the tree for less than $100 each.

Tidings of Joy(sticks). The lifespan of a joystick is probably less than that of your average Christmas lightbulb or alkaline battery. If you have a heavy-duty arcade fanatic on your gift list, you may want to consider either the Magnum or Warrior joystick. Both retail for $7.95 and come in a pistol-grip configuration with bubble switches.

Super Stocking Stuffers—For Up to $50

Touché, Amiga! Tired of hearing about the Amiga's high resolution and nifty colors? Check out I Paint ($39.95) for the C-128. I Paint invokes the 128's little known Interlace mode, similar to that on the Amiga. This mode provides an effective resolution of 640×400 pixels and an expanded palette of thousands of apparent colors. A 64K VDC chip is required.

More Than 20 Questions. If you're weary of your spouse asking questions about computers, why not give him or her Voyager Mindtool's *500 C-128 Questions Answered* ($16.95). This all-new guidebook is the definitive reference for almost any question about the C-128. Subjects range from programming to software applications to simple hardware maintenance.

Sticky Business. The ReMarkAble Label System ($39.95) is a great way to solve a loved one's disk labeling headache. The RMA System includes 100 white and 100 color-coded thin, adhesive plastic labels and a special marker. Marked labels can be easily erased for disk updates.

Bug-Eyed. Eyestrain from too much time at the computer can cause headaches and irritability. The Eye-Mate Optical Massage Device may help relieve stress around the eyes after prolonged monitor use. This $39.95 unit is worn like eyeglasses. Tiny, battery-operated dynamos massage nine different areas around the eyes.

Stereo SID. The SID Symphony Stereo Cartridge ($35) makes a superb gift for the music lover. This small black box plugs directly into the expansion port of the C-64 or C-128, adding three voices to the SID chip and making stereo playback possible. The cartridge is powered directly from the user port, is fully programmable and is compatible with Sidplayer and the Sidplayer files found on most commercial networks and BBSs.

A Healthy New Year—For Less Than $100

A Good Lead. You can protect a loved one from the possibly cancer-causing radiation emitted by video monitors with the Maxi-Lite video display apron. Selling for $99, this lightweight apron is lined with .33 millimeters of lead to absorb stray electromagnetic energy.

Plus and Minus. Along with the apron, why not buy the Screen E.L.F. ($99.95)? This small device sits atop the video monitor and generates a steady stream of negative ions within a six-foot radius. These ions counter harmful positive ions that can be generated by the high voltage of video display devices. If nothing else, with the apron, the E.L.F. and the Eye-Mate glasses, you'll be set for the next shuttle launch.

In a Jiff. If you've ever watched someone age before your eyes while loading a file with a 1541 disk drive, consider buying them the JiffyDOS disk drive enhancement system from Creative Micro Designs ($59.95 for the C-64, $69.95 for the C-128). JiffyDOS is a hardware and software combination that not only greatly improves disk drive performance, but places screen dump functions, file-copy routines and DOS-wedge commands at your fingertips.

Santa Really Delivers—For Over $100

If you can spend more than $100, you may want to consider buying premium gifts that are sure to please even the most discriminating Commodore user.

Socket to 'Em. Anyone with a desk full of disk drives, printers and other peripherals can tell you that wall sockets and power buttons always seem to

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be in the wrong place. Solve this problem for friend or family with the Curtis Command Center. At $149.95, this sleek system offers push-button control for up to five peripherals, making it easy to arrange an entire computer system. With plenty of socket space, plus a high level of power and telephone-line surge protection, this is a high-voltage gift for any computer enthusiast.

Data phones. Some lucky person on your list can be the first on the block to have Computerfone, a two-way telephone-to-C-64 voice digitizer and phone control unit. Operating from the computer's RS-232 interface, Computerfone accepts, digitizes, stores and transfers incoming speech. It also dials telephones and converts tone to a standard digital signal for further processing. Computerfone automates an office or home office telephone system for $695.

Drive Someone Crazy. Do you have a real power user on your list this year? If so, supercharge his or her system with a Commodore-compatible hard drive from Creative Micro Designs. The HD series of drives comes in 20-, 40- and 100-megabyte configurations for $600, $800 and $1300, respectively. They offer a high degree of compatibility with most nonprotected C-64 and C-128 programs, and they're compatible with GEOS, CP/M and CMD's JiffyDOS system.

Printer Power. If you really want to wow your favorite power user, give him or her a Tandy LP 1000 laser printer, a high-quality dynamo with an output of six pages per minute. The standard LP 1000 configuration includes one megabyte of memory and eight fonts. It works well with GEOS, Basic 8 and RUN Script, and it can emulate Tandy's DMP 2110 printer as well as IBM's Wheelprinter and Prowriter. The unit delivers over 1500 pages per toner cartridge (replacements can be purchased at your local Radio Shack store). Suggested retail is $2634.

So there it is, *RUN*'s 1990 holiday shopping list. Armed with these suggestions, surely you can please any Commodore owner on your list—and at a price within your budget.

By the way, I've always wanted one of those fuzzy little covers for my 1351 mouse. . . ■

John Ryan, one of RUN*'s contributing editors, works as an air traffic control instructor. His favorite topic is guiding airborne sleighs on cold December nights.*

A gift of a Curtis Command Center or a CMD hard drive would be a hit with any Commodore user.

Table 1. Products and manufacturers.

GEnie
GE Information Services
401 North Washington St.
Rockville, MD 20850

Q-Link
Quantum Computer Services
8620 Westwood Center Drive
Vienna, VA 22180

Commodore Modem
RUN
80 Elm St.
Peterborough, NH 03458

Musician's Music Software Catalog
Digital Arts & Technologies
21 Glen Ridge Rd.
Dept. BR
Mahopac, NY 10541

Magnum and Warrior
Camerica
230 5th Ave.
New York, NY 10011

I Paint and
500 C-128 Questions Answered
Voyager Mindtools
PO Box 11578
Minneapolis, MN 55411

ReMarkAble Label System
Weber & Sons
3468 Highway 9, RD #4
Freehold, NJ 07728

Eye-Mate Optical Massage Device
Man Wah Corp.
57 Erickson Drive
Red Deer, Alberta
Canada T4R 1X8

SID Symphony Stereo Cartridge
Dr. Evil Labs
3885 Bohannon Drive
Menlo Park, CA 94025

Maxi-Lite
A. D. Carroll, Inc.
Maxi-Lite Division
500 N. Temple Blvd.
Temple, PA 19560

Screen E.L.F.
Zenion Industries
5430 Commerce Blvd.
Rohnert Park, CA 94928

JiffyDOS and
HD Series Hard Drives
Creative Micro Designs
PO Box 646
East Longmeadow, MA 01028

Curtis Command Center
Curtis Manufacturing Co.
30 Fitzgerald Drive
Jaffrey, NH 03452

Computerfone
SunCoast Systems
PO Box 7105
Pensacola, FL 32514

LP 1000
Tandy Corp.
1700 One Tandy Center
Fort Worth, TX 76102

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Why wait any longer to join the Information Revolution? Especially when Aprotek has just made it so easy for you to buy today! How? By giving you easy to use high-speed modems at breakthrough prices! A modem is just a device that allows your computer to talk to other computers over ordinary phone lines. Modems come in different speeds. Right now, 2400 baud is the fastest speed that's practical for the dial-up phone system.

For the more experienced among you, the Aprotek Minimodems are completely Hayes "AT" command set and are 2400 baud "ampersand command" compatible, auto-dial, auto-answer devices that auto-switch between 300, 1200, and 2400 baud for maximum communications flexibility and service compatibility. Minimodems carry built-in sound capabilities (internal speaker on the RS-232 & C64/128 versions, monitor speaker on the Amiga version) and a full array of status indicator lights.

If you're new to telecommunications, don't let the terms above throw you - it's just a technical way of saying that Minimodems will give you every feature you could ever need in modem.

The C64/128 Minimodem plugs directly into the user port on the back of your computer. The Amiga version plugs right into the serial port and comes with a built in extension cable so you'll be able to use it with an Amiga 500 or 2000 series and still be able to see the status indicator lights. The Commodore version works on ALL 64's or 128's ever made, while the Amiga version works on the 500 or the 2000/2500 series of computers. A separate RS-232 and Amiga 1000 version is also available (please call for details).

The most exciting aspect of the Minimodems is the remarkable prices! We've NEVER been able to offer this kind of sophisticated power at prices so low before! Now there's no good reason not to get involved in the Information Revolution today — and begin exploring the world of tomorrow.

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6216	MINIMODEM-AM24™ (AMIGA 500/2000 SELF PWD)	99.95	_____	_____
6212	MINIMODEM-C™ (1200B Commodore)	64.95	_____	_____
6214	MINIMODEM-H™ (1200B RS-232, specify M/F)	74.95	_____	_____

Modem shipping—Cont. US $6.00; UPS Blue, CAN, AK, HI, APO $10.00

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CONVERT-A-COM will convert your Aprotek Minimodem-C or C-24 into a 100% Hayes compatible modem to use with your other computer. It will also work with Commodore 16xx series and Lynker types, but with their reduced Hayes command set. This unit is not usable with an Anchor 6480 type modem because of software inavailability.

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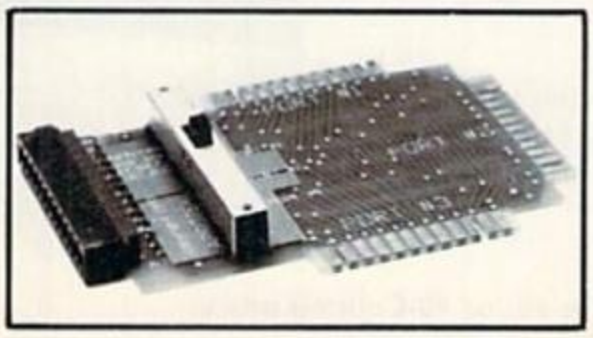
Finally, for all you C-64 & 128 owners who have more than one device that plugs into your user port, (and especially you ham operators), we have your solution. **USER SWITCH** is a device which will allow you to attach everything (up to 3) and simply select the one you want to use. We've designed **USER SWITCH** so that pins B, C, D, E, F, H, J, K, L, M, 2 & 3 are switched. This gives you maximum compatibility because virtually all user port devices use only some or all of these (All others are connected straight through.)

In most cases you can put any device on any of the 3 port outputs. A few devices may be too bulky to plug into port #3, so #1 or #2 can be used for a bulky user port device.



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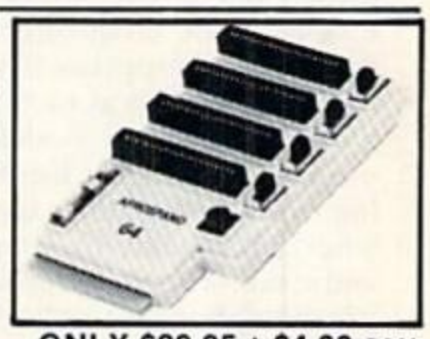

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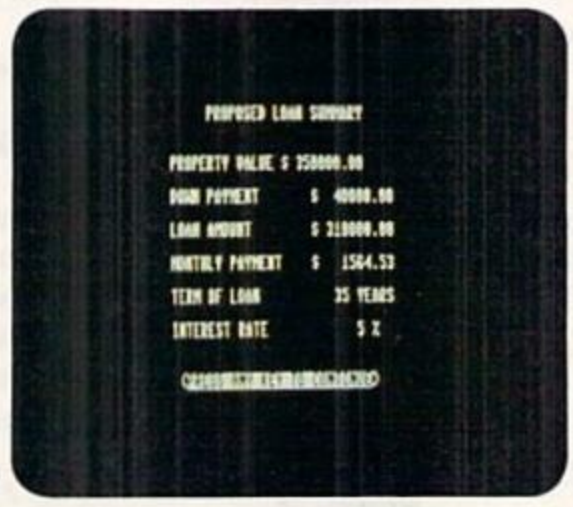
PROPOSED LOAN SUMMARY
PROPERTY VALUE $ 250000.00
DOWN PAYMENT $ 40000.00
LOAN AMOUNT $ 210000.00
MONTHLY PAYMENT $ 1564.53
TERM OF LOAN 25 YEARS
INTEREST RATE 9 %

Prequalify works with the numbers you input to assess your borrowing potential.

By THEODORE YONAN

One of the most difficult aspects of buying a house is shopping for the mortgage. Will a financial institution trust you to pay back $100,000 or more? Asking will be easier if you use Prequalify 64/128 to assess your qualifications *before* you go to the lender.

Guidelines

Type in Listing 1, using *RUN*'s Checksum program to look for typing errors, and save it to disk before running it. To use Prequalify, simply input the figures appropriate to your current financial situation at each prompt.

The qualification guidelines lenders use for conventional loans are simple, but exact figures differ from lender to lender. Prequalify uses typical figures and assumes that your monthly housing expenses shouldn't exceed 28 percent of your gross monthly income and, with monthly debt payments added in, shouldn't exceed 36 percent.

Refer to Table 1 to see how the guidelines are calculated. Monthly income (A) includes all your predictable income (salaries, bonuses, commissions, interest income, and so on). Monthly housing expenses (B) include payments on loan principal and interest, insurance, taxes, homeowners' association fees and assessments for special community services. Liabilities (C) include monthly payments on alimony and child support, loans, charge accounts and credit cards (including a 5 percent monthly charge against total card indebtedness), tuition, other real estate, and any other regular obligations.

Note that if your down payment is less than 10 percent of the purchase price, guideline 1 drops to 25 percent and guideline 2 to 33 percent. The smaller your down payment, the more stringent the guidelines.

Also, if your down payment is less than 20 percent of the purchase price, the lender will insist that you take out private mortgage insurance (PMI) at a cost of 1–1.25 percent of the loan amount, paid up front at closing, plus 0.3–0.4 of 1 percent, paid monthly ($25–$33 per month on a $100,000 loan).

Income minus housing and liability payments equals your monthly expendable income, which covers food, clothing, entertainment, medical, dental, education, transportation and other "discretionary" expenses. It is expendable income that determines to a substantial degree your quality of life, and the VA and FHA weigh it more heavily than banks in determining qualification for a loan. A conventional loan is granted on the basis of credit worthiness and the value of the property held for security; the FHA and VA make sure you'll end up with enough cash to live decently.

After the screening to see if you qualify financially, most lenders want to check your financial, personal and employment records. Prequalify prints a checklist of such items you can review before going to your lender.

Other Costs

Assuming your loan is approved, you must have sufficient funds to cover closing costs (a down payment, points, and so on).

On a conventional loan, a down payment is 10–20 percent of the purchase price. On an FHA loan, it's 3 percent of the first $25,000, plus 5 percent of the amount beyond $25,000. On a VA loan, no down payment is needed if the price is equal to four times the entitlement ►

Table 1. Loan qualification guidelines.

Components:

A. Monthly income
B. Monthly housing expense
C. Monthly liability (debt) payments

Guidelines:

1. B divided by A not to exceed 0.28 (28 percent)
2. B plus C divided by A not to exceed 0.36 (36 percent)

RUN it right: **C-64 or C-128 (in 40- or 80-Column mode)**

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HOUSE-SHOPPING?

(benefits provided by the government to a specific group), but for any amount over four times the entitlement, a down payment is 25 percent.

Then there are points, each representing approximately 1 percent of the loan amount. Don't be bashful about shopping around to get the lowest percentage.

You may also have to impound escrow money to cover property taxes, mortgage insurance premiums and community service fees.

A loan origination fee may be necessary. It can range from 0.5 to 2 percent of the loan amount, so, once again, shop around.

Finally, count on other fees and charges approaching 1–2 percent of the loan amount.

Shopping for a home will challenge your business acumen and negotiating skills. Use Prequalify 64/128 to help you play the game prudently. R

Theodore Yonan has been in the real estate business for 14 years.

Listing 1. Prequalify 64/128 program. (Available on ReRUN disk. See order card facing page 48.)

```
10 REM PREQUALIFY 64/128
                          :REM*183
20 IFPEEK(215)=128THENTB=22:C=2
   8                      :REM*159
30 IFPEEK(215)=0ORPEEK(215)=13T
   HENTB=2:C=25           :REM*144
40 GOTO200                :REM*103
50 POKE53265,11:RETURN    :REM*162
60 POKE53265,27:RETURN    :REM*234
70 GETDE$:IFDE$=""THEN70
                          :REM*237
80 PRINTCHR$(147):RETURN
                          :REM*227
90 FORSPACING=1TOVTAB:PRINT:NEX
   T:RETURN               :REM*32
100 REM                   :REM*243
110 PRINTTAB(TB+3)"<{CTRL 9}PRE
   SS ANY KEY TO CONTINUE{CTRL
    0}>":RETURN           :REM*70
120 REM                   :REM*6
130 IFV<.005ANDV>=-.005THENV$="
   0.00":GOTO170          :REM*23
140 V=V+.005*SGN(V):V$=STR$(V)
                          :REM*164
150 FORJ=1TOLEN(V$):IFMID$(V$,J
   ,1)="."THENV$=LEFT$(V$,J+2)
   :GOTO170               :REM*79
160 NEXT:V$=V$+".00":GOTO170
                          :REM*105
170 IFLEN(V$)<10THENV$=" "+V$:G
   OTO170                 :REM*212
180 V$="$"+V$             :REM*4
190 RETURN                :REM*77
200 PRINTCHR$(147)CHR$(5):POKE5
   3281,0:POKE53280,0     :REM*163
210 PRINT                 :REM*106
220 GOSUB1960             :REM*58
230 PRINTCHR$(147):GOSUB50
                          :REM*143
240 PRINTTAB(TB+2)"PRE-QUALIFYI
   NG FOR A MORTGAGE"     :REM*212
250 VTAB=3:GOSUB90        :REM*92
260 PRINTTAB(TB+2)"YOUR ANNUAL
   INCOME"                :REM*230
270 PRINT                 :REM*166
280 PRINTTAB(TB+2)"SPOUSE'S ANN
   UAL INCOME"            :REM*181
290 PRINT                 :REM*186
300 PRINTTAB(TB+2)"BONUSES/COMM
   ISSIONS "              :REM*83
310 PRINT                 :REM*206
320 PRINTTAB(TB+2)"DIVIDENDS/IN
   TEREST INCOME{2 SPACEs}"
                          :REM*204
330 PRINT                 :REM*226
340 PRINTTAB(TB+2)"OTHER INCOME
    (NET) "               :REM*23
350 GOSUB60               :REM*229
360 PRINTCHR$(19):VTAB=4:GOSUB9
   0:PRINTTAB(TB+22);:INPUTGI
                          :REM*136
370 PRINT:PRINTTAB(TB+26);:INPU
   T WI                   :REM*239
380 PRINT:PRINTTAB(TB+22);:INPU
   T BC                   :REM*10
390 PRINT:PRINTTAB(TB+29);:INPU
   T DV                   :REM*135
400 PRINT:PRINTTAB(TB+22);:INPU
   T OI                   :REM*121
410 V=GI:GOSUB120:GI$=V$
                          :REM*194
420 V=WI:GOSUB120:WI$=V$
                          :REM*255
430 V=BC:GOSUB120:BC$=V$
                          :REM*112
440 V=DV:GOSUB120:DV$=V$
                          :REM*133
450 V=OI:GOSUB120:OI$=V$
                          :REM*169
460 AGI=(GI+WI+BC+DV+OI)/12:V=A
   GI:GOSUB120:AGI$=V$    :REM*94
470 V=AGI*12:GOSUB120:TY$=V$
                          :REM*189
480 VTAB=6:GOSUB90        :REM*85
490 GOSUB100:GOSUB70      :REM*145
500 PRINT                 :REM*143
510 GOSUB50               :REM*134
520 PRINTTAB(TB+3)"QUALIFYING F
   OR A HOME LOAN"        :REM*148
530 VTAB=4:GOSUB90        :REM*127
540 PRINTTAB(TB+2)"ASKING PRICE
    OF HOUSE ":PRINT      :REM*108
550 PRINTTAB(TB+2)"DOWN PAYMENT
   ":PRINT                :REM*158
560 PRINTTAB(TB+2)"INTEREST (8.
   8%=8.8) ":PRINT        :REM*216
570 PRINTTAB(TB+2)"MORTGAGE TER
   M: (YEARS) ":PRINT     :REM*112
580 GOSUB60               :REM*206
590 PRINTCHR$(19):VTAB=6:GOSUB9
   0:PRINTTAB(TB+26);:INPUTPR
                          :REM*18
600 PRINT:PRINTTAB(TB+20);:INPU
   TDP                    :REM*254
610 PRINT:PRINTTAB(TB+25);:INPU
   TIR                    :REM*88
620 PRINT:PRINTTAB(TB+27);:INPU
   TYR                    :REM*71
630 MOS=YR*12:I=IR/1200:AMT=PR-
   DP                     :REM*9
640 PAYMENT=AMT*I/(1-(1+I){UP A
   RROW}(-MOS))           :REM*35
650 V=PA:GOSUB130:PA$=V$
                          :REM*203
660 V=AMT:GOSUB130:AMT$=V$
                          :REM*237
670 V=PR:GOSUB130:PR$=V$:REM*41
680 V=DP:GOSUB130:DP$=V$
                          :REM*108
690 VTAB=5:GOSUB90        :REM*6
700 GOSUB110:GOSUB70:GOSUB50
                          :REM*154
710 PRINT                 :REM*92
720 PRINTTAB(TB+7)"PROPOSED LOA
   N SUMMARY":VTAB=2:GOSUB90
                          :REM*233
730 PRINTTAB(TB+2)"PROPERTY VAL
   UE "PR$:PRINT          :REM*241
740 PRINTTAB(TB+2)"DOWN PAYMENT
   {7 SPACEs}"DP$:PRINT
                          :REM*173
750 PRINTTAB(TB+2)"LOAN AMOUNT{
   8 SPACEs}"AMT$:PRINT:REM*75
760 PRINTTAB(TB+2)"MONTHLY PAYM
   ENT{4 SPACEs}"PA$:PRINT
                          :REM*29
770 PRINTTAB(TB+2)"TERM OF LOAN
   {9 SPACEs}"YRS "YEARS":PRIN
   T                      :REM*238
780 PRINTTAB(TB+2)"INTEREST RAT
   E{11 SPACEs}"IR"%"     :REM*55
790 PRINT:PRINT           :REM*235
800 GOSUB110:GOSUB60:GOSUB70:GO
   SUB50                  :REM*145
810 PRINTCHR$(147)TAB(TB+12)"OT
   HER COSTS":PRINT       :REM*190
820 PRINTTAB(TB)"CONDO OR TOWNH
   OUSE MONTHLY FEE." :REM*123
830 PRINTTAB(TB)"ENTER DATA NOW
   . IF YOU WANT TO USE "
                          :REM*13
840 PRINTTAB(TB)"THE PERCENT ES
   TIMATE, JUST PRESS{2 SPACEs
   }"                     :REM*79
850 PRINTTAB(TB)"RETURN. ":PRIN
   T                      :REM*171
860 GOSUB60               :REM*225
870 PRINTTAB(TB)"ENTER ANNUAL T
   AXES ";:INPUTTX        :REM*14
880 IFTX>1THENTX=TX/12:V=TX:GOS
   UB120:TX$=V$:GOTO900
                          :REM*242
```


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```
89Ø IFTX=ØTHENTX=.Ø15*PR/12:V=T
    X:GOSUB12Ø:TX$=V$   :REM*245
9ØØ PRINT:PRINTTAB(TB)"ANNUAL I
    NSURANCE PREMIUM ";:INPUTIP
                        :REM*4
91Ø IFIP>1THENIP=IP/12:V=IP:GOS
    UB12Ø:IP$=V$:GOTO93Ø :REM*5
92Ø IFIP=ØTHENIP=.Ø1*PR/12:V=IP
    :GOSUB12Ø:IP$=V$    :REM*196
93Ø PRINT:PRINTTAB(TB)"OTHER MO
    NTHLY COSTS ";:INPUTMC:V=MC
    :GOSUB12Ø:MC$=V$    :REM*127
94Ø IFDP<.2*PRTHENPMI=(.ØØ35/12
    )*PR:V=PMI:GOSUB12Ø:PMI$=V$
                        :REM*52
95Ø IFDP=>.2*PRTHENPMI=Ø:V=PMI:
    GOSUB12Ø:PMI$=V$    :REM*185
96Ø T=TX+IP+MC+PA+PMI   :REM*144
97Ø V=T:GOSUB12Ø:T$=V$  :REM*154
98Ø PRINTTAB(TB+6)"TAXES{6 SPAC
    Es}"TX$             :REM*21Ø
99Ø PRINTTAB(TB+6)"INSURANCE{2
    SPACEs}"IP$         :REM*1Ø4
1ØØØ PRINTTAB(TB+6)"OTHER{6 SPA
     CEs}"MC$           :REM*73
1Ø1Ø IFPMI>ØTHENPRINTTAB(TB+6)"
     PR.MTG.INS."PMI$   :REM*172
1Ø2Ø PRINTTAB(TB+6)"PRIN.& INT.
     "PA$:PRINT         :REM*99
1Ø3Ø PRINT:PRINTTAB(TB+6)"TOTAL
     {6 SHFT SPACEs}"T$:PRINT
                        :REM*38
1Ø4Ø GOSUB11Ø:GOSUB6Ø:GOSUB7Ø:G
    OSUB5Ø              :REM*13Ø
1Ø5Ø PRINT              :REM*183
1Ø6Ø PRINT              :REM*185
1Ø7Ø FORJ=1TO14:PRINTTAB(TB+5)A
    $(J):NEXT           :REM*168
1Ø8Ø PRINT              :REM*213
1Ø9Ø PRINTTAB(TB)"*ENTER CREDIT
      CARD BALANCE, NOT":REM*35
11ØØ PRINTTAB(TB)"MONTHLY PAYME
    NT. (DUE=5% BAL.)":REM*152
111Ø GOSUB6Ø            :REM*218
112Ø PRINTCHR$(19)TAB(TB+3)"ENT
    ER MONTHLY DEBT PAYMENTS"
                        :REM*2ØØ
113Ø PRINT:PRINT        :REM*69
114Ø PRINTTAB(TB+C);:INPUTC1:V=
    C1:GOSUB13Ø:B$(1)=V$
                        :REM*153
115Ø PRINTTAB(TB+C);:INPUTC2:V=
    C2:GOSUB13Ø:B$(2)=V$
                        :REM*219
116Ø PRINTTAB(TB+C);:INPUTCS:V=
    CS:GOSUB13Ø:B$(3)=V$
                        :REM*185
117Ø PRINTTAB(TB+C);:INPUTAL:V=
    AL:GOSUB13Ø:B$(4)=V$
                        :REM*194
118Ø PRINTTAB(TB+C);:INPUTYL:V=
    YL:GOSUB13Ø:B$(5)=V$
                        :REM*1Ø7
119Ø PRINTTAB(TB+C);:INPUTSL:V=
    SL:GOSUB13Ø:B$(6)=V$
                        :REM*2Ø
12ØØ PRINTTAB(TB+C);:INPUTCT:V=
    CT:GOSUB13Ø:B$(7)=V$
                        :REM*74
121Ø PRINTTAB(TB+C);:INPUTOL:V=
    OL:GOSUB13Ø:B$(8)=V$
                        :REM*2Ø2
122Ø PRINTTAB(TB+C);:INPUTTG:V=
    TG:GOSUB13Ø:B$(9)=V$
                        :REM*239
123Ø PRINTTAB(TB+C);:INPUTVI:V=
    VI/2Ø:GOSUB13Ø:B$(1Ø)=V$
                        :REM*1Ø2
124Ø PRINTTAB(TB+C);:INPUTMA:V=
    MA/2Ø:GOSUB13Ø:B$(11)=V$
                        :REM*147
125Ø PRINTTAB(TB+C);:INPUTAX:V=
    AX/2Ø:GOSUB13Ø:B$(12)=V$
                        :REM*16
126Ø PRINTTAB(TB+C);:INPUTDI:V=
    DI/2Ø:GOSUB13Ø:B$(13)=V$
                        :REM*2ØØ
127Ø PRINTTAB(TB+C);:INPUTOT:V=
    OT/2Ø:GOSUB13Ø:B$(14)=V$
                        :REM*19Ø
128Ø CC=(VI+MA+AX+DI+OT)/2Ø:V=C
    C:GOSUB13Ø:CC$=V$   :REM*81
129Ø MO=C1+C2+CS+AL+YL+SL+CT+OL
    +TG+CC:V=MO:GOSUB13Ø:MO$=V
    $:                  :REM*178
13ØØ TM=MO+T:V=TM:GOSUB13Ø:TM$=
    V$                  :REM*211
131Ø TW=.28*AGI:V=TW:GOSUB13Ø:T
    W$=V$               :REM*23Ø
132Ø TS=.36*AGI:V=TS:GOSUB13Ø:T
    S$=V$               :REM*13Ø
133Ø TP=.25*AGI:V=TP:GOSUB13Ø:T
    P$=V$               :REM*249
134Ø TQ=.33*AGI:V=TQ:GOSUB13Ø:T
    Q$=V$               :REM*2Ø4
135Ø VTAB=4:GOSUB9Ø     :REM*182
136Ø GOSUB11Ø:GOSUB7Ø:GOSUB5Ø
                        :REM*13
137Ø PRINTTAB(TB+3)"SUMMARY FIX
    ED MONTHLY PAYMENTS"
                        :REM*59
138Ø PRINT              :REM*248
139Ø FORJ=1TO14:PRINTTAB(TB+2)A
    $(J)B$(J):NEXT      :REM*171
14ØØ PRINT              :REM*23
141Ø PRINTTAB(TB+2)"TOTAL="MO$
                        :REM*185
142Ø PRINT              :REM*35
143Ø GOSUB1ØØ:GOSUB6Ø:GOSUB7Ø:G
    OSUB5Ø              :REM*7
144Ø PRINTTAB(TB+9)"CONCLUSIONS
    :"                  :REM*4Ø
145Ø PRINT              :REM*69
146Ø PRINTTAB(TB)C$(2)T$
                        :REM*2Ø4
147Ø PRINT              :REM*81
148Ø PRINTTAB(TB)C$(3)MO$
                        :REM*152
149Ø PRINT              :REM*1Ø9
15ØØ PRINTTAB(TB)C$(4)TM$
                        :REM*2Ø6
151Ø PRINT              :REM*121
152Ø PRINTTAB(TB)C$(5)AGI$
                        :REM*172
153Ø PRINT              :REM*149
154Ø IFDP<.1Ø*PRTHEN161Ø:REM*99
155Ø PRINTTAB(TB)C$(6)TW$
                        :REM*139
156Ø PRINTTAB(TB)C$(7)T$
                        :REM*124
157Ø IFTW<TTHENTN=T-TW:V=TN:GOS
    UB12Ø:TN$=V$        :REM*114
158Ø IFTW<TTHENPRINTTAB(TB)C$(8
    )TN$                :REM*48
159Ø PRINT              :REM*2Ø1
16ØØ IFDP=>.1Ø*PRTHEN165Ø
                        :REM*79
161Ø PRINTTAB(TB)C$(9)TP$
                        :REM*136
162Ø PRINTTAB(TB)C$(7)T$
                        :REM*176
163Ø IFTP<TTHENTL=T-TP:V=TL:GOS
    UB12Ø:TL$=V$        :REM*15Ø
164Ø IFTP<TTHENPRINTTAB(TB)C$(8
    )TL$                :REM*51
165Ø PRINT              :REM*12
166Ø IFDP<.1Ø*PRTHEN174Ø
                        :REM*22Ø
167Ø PRINT              :REM*24
168Ø PRINTTAB(TB)C$(12)TS$
                        :REM*131
169Ø PRINTTAB(TB)C$(13)TM$
                        :REM*125
17ØØ IFTM=<TSTHEN181Ø   :REM*158
171Ø IFTM>TSTHENMT=TM-TS:V=MT:G
    OSUB12Ø:MT$=V$      :REM*141
172Ø IFTM=<TQTHEN181Ø   :REM*228
173Ø PRINTTAB(TB)C$(8)MT$
                        :REM*254
174Ø PRINT              :REM*98
175Ø IFDP=>.1Ø*PRTHEN182Ø
                        :REM*49
176Ø PRINTTAB(TB)C$(15)TQ$
                        :REM*239
177Ø PRINTTAB(TB)C$(13)TM$
                        :REM*173
178Ø IFTM>TQTHENMT=TM-TQ:V=MT:G
    OSUB12Ø:MT$=V$      :REM*233
179Ø IFTM=<TQTHEN181Ø   :REM*43
18ØØ PRINTTAB(TB)C$(8)MT$
                        :REM*55
181Ø PRINT              :REM*172
182Ø IFTM<AGITHEN184Ø   :REM*147
183Ø IFTM>AGITHENPRINTTAB(TB)C$
    (16)                :REM*45
184Ø PRINT              :REM*2Ø6
185Ø GOSUB1ØØ:GOSUB6Ø:GOSUB7Ø
                        :REM*17
186Ø VTAB=3:GOSUB9Ø     :REM*128
187Ø PRINT"PRINT C=CHECKLIST S=
    SUMMARY N=NO Q=QUIT"
                        :REM*67
188Ø GET RP$:IFRP$=""THEN188Ø
                        :REM*149
189Ø IFRP$<>"C"ANDRP$<>"S"ANDRP
    $<>"N"ANDRP$<>"Q"THEN188Ø
                        :REM*131
19ØØ IFRP$="Q"THEN195Ø  :REM*24Ø
191Ø IFRP$="N"THENCLR:GOTO1Ø
                        :REM*176
192Ø IFRP$="S"THENOPEN4,4,7:GOS
    UB27ØØ:PRINTCHR$(147):GOTO
    187Ø                :REM*14
193Ø IFRP$="C"THENOPEN4,4,7:FOR
    C=ØTO21:PRINT#4,TAB(1Ø)D$(
    C):PRINT#4:NEXT:CLOSE4
                        :REM*154 ►
```


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HOUSE-SHOPPING?

```
194Ø PRINTCHR$(147):GOTO187Ø
                          :REM*69
195Ø CLR:PRINTCHR$(147):END
                          :REM*199
196Ø PRINTCHR$(147):      :REM*88
197Ø GOSUB5Ø              :REM*48
198Ø FORJ=1TO8:PRINT:NEXT
                          :REM*182
199Ø PRINTTAB(TB+3)"{COMD A}{29
     SHFT *s}{COMD S}     :REM*51
2ØØØ FORI=1TO7:PRINTTAB(TB+3)"{
     SHFT -}"TAB(TB+33)"{SHFT -
     }":NEXT              :REM*243
2Ø1Ø PRINTTAB(TB+3)"{COMD Z}{29
     SHFT *s}{COMD X}":REM*228
2Ø2Ø FORJ=1TO8:PRINTCHR$(145);:
     NEXT                 :REM*77
2Ø3Ø PRINTTAB(TB+13)"RUN MAGAZI
     NE"                  :REM*54
2Ø4Ø PRINT                :REM*153
2Ø5Ø PRINTTAB(TB+15)"PRESENTS"
                          :REM*213
2Ø6Ø PRINT:PRINT          :REM*238
2Ø7Ø PRINTTAB(TB+11)"PREQUALIFY
     64/128               :REM*193
2Ø8Ø GOSUB6Ø               :REM*16Ø
2Ø9Ø DIM A$(15),B$(15),C$(2Ø),D
     $(22)                :REM*56
21ØØ A$(1)="CAR #1 PAYMENT{4 SP
     ACEs}"               :REM*76
211Ø A$(2)="CAR #2 PAYMENT{4 SP
     ACEs}"               :REM*1Ø3
212Ø A$(3)="CHILD SUPPORT{5 SPA
     CEs}"                :REM*48
213Ø A$(4)="ALIMONY{11 SPACEs}"
                          :REM*37
214Ø A$(5)="YOUR SCHOOL LOANS "
                          :REM*61
215Ø A$(6)="OTHER SCHOOL LOAN "
                          :REM*27
216Ø A$(7)="CHILDREN' TUITION{2
     SPACEs}"             :REM*235
217Ø A$(8)="OTHER LOANS/REALTY"
                          :REM*175
218Ø A$(9)="TITHING{11 SPACEs}"
                          :REM*95
219Ø A$(1Ø)="*VISA{14 SPACEs}"
                          :REM*161
22ØØ A$(11)="*MASTERCARD{8 SPAC
     Es}"                 :REM*154
221Ø A$(12)="*AMERICAN EXPRESS{
     2 SPACEs}"           :REM*3Ø
222Ø A$(13)="*DISCOVER CARD{5 S
     PACEs}"              :REM*89
223Ø A$(14)="*MISC. CREDIT CARD
     "                    :REM*73
224Ø FORJ=1TO14           :REM*1Ø3
225Ø IFLEN(A$(J))<2ØTHENA$(J)=L
     EFT$(A$(J)+"{2Ø SPACEs}",2
     Ø):GOTO225Ø          :REM*195
226Ø NEXT                 :REM*95
227Ø C$(1)="PRE-QUALIFICATION R
     EVIEW."              :REM*8Ø
228Ø C$(2)="MONTHLY HOUSING EXP
     ENSES"               :REM*182
229Ø C$(3)="FIXED MONTHLY PAYME
     NTS"                 :REM*28
23ØØ C$(4)="SUM:MONTHLY OBLIGAT
     IONS"                :REM*151
231Ø C$(5)="GROSS MONTHLY INCOM
     E:"                  :REM*8Ø
232Ø C$(6)="28% OF MONTHLY INCO
     ME="                 :REM*141
233Ø C$(7)="MONTHLY HOUSING EXP
     ENSES="              :REM*15Ø
234Ø C$(8)="YOU EXCEEDED LIMIT
     BY:"                 :REM*75
235Ø C$(9)="25% OF MONTHLY INCO
     ME="                 :REM*154
236Ø C$(1Ø)="MONTHLY HOUSING EX
     PENSES="             :REM*218
237Ø C$(11)="YOU EXCEEDED LIMIT
      BY:"                :REM*65
238Ø C$(12)="36% OF MONTHLY INC
     OME="                :REM*97
239Ø C$(13)="SUM:MONTHLY OBLIGA
     TIONS"               :REM*185
24ØØ C$(14)="YOU EXCEEDED LIMIT
      BY:"                :REM*126
241Ø C$(15)="33% OF MONTHLY INC
     OME="                :REM*112
242Ø FORJ=2TO15           :REM*39
243Ø IFLEN(C$(J))=<25THENC$(J)=
     C$(J)+" ":GOTO243Ø:REM*247
244Ø D$(Ø)="{7 SPACEs}PERSONAL
     DATA CHECKLIST"+CHR$(13)+C
     HR$(13)              :REM*188
245Ø NEXT                 :REM*3Ø
246Ø C$(16)="YOU'RE SPENDING MO
     RE THAN YOU EARN!"   :REM*12
247Ø D$(Ø)="{7 SPACEs}PERSONAL
     DATA CHECKLIST"      :REM*39
248Ø D$(1)=" 1. BORROWER(S) NAM
     E/ADDRESS/SOCIAL SECURITY
     NOS.:"               :REM*226
249Ø D$(2)=" 2. EMPLOYERS:LAST
     TWO YEARS"           :REM*1Ø7
25ØØ D$(3)=" 3. ADDRESSES YOU H
     AD DURING LAST 2 YEARS"
                          :REM*2
251Ø D$(4)=" 4. ACCOUNT/SERIAL
     NUMBERS OF ALL CURRENT ASS
     ETS:"                :REM*134
252Ø D$(5)=" 5. INVENTORY:MAJOR
      PERSONAL/HOUSEHOLD ASSETS
     :"                   :REM*28
253Ø D$(6)=" 6. SHARE/BOND HOLD
     ING SPECIFICS"       :REM*18Ø
254Ø D$(7)=" 7. LIFE INSURANCE
     CERTIFICATES/CASH VALUES"
                          :REM*3
255Ø D$(8)="{SHFT SPACE}8. AUTO
     MOBILES:LOAN VALUES"
                          :REM*193
256Ø D$(9)=" 9. ALL CURRENT LIA
     BILITIES FULLY DETAILED"
                          :REM*11
257Ø D$(1Ø)="1Ø. FINANCIAL DATA
      ON REALTY HOLDINGS"
                          :REM*36
258Ø D$(11)="11. INCOME VERIFIC
     ATION DOCUMENTATION."
                          :REM*68
259Ø D$(12)="12. IF SELF-EMPLOY
     ED:"                 :REM*68
26ØØ D$(13)="{4 SPACEs}INCOME V
     ERIFICATION DOCUMENTATION"
                          :REM*1Ø5
261Ø D$(14)="{4 SPACEs}PLUS TWO
      YEARS TAX RETURNS":REM*93
262Ø D$(15)="13. IF DIVORCED, P
     ROPER DOCUMENTATION"
                          :REM*251
263Ø D$(16)="14. EVIDENCE OF SU
     FFICIENT FUNDS TO CLOSE:"
                          :REM*242
264Ø D$(17)="{4 SPACEs}DOWN PAY
     MENT:"               :REM*182
265Ø D$(18)="{4 SPACEs}ESCROW {
     SHFT F}UNDS:"        :REM*54
266Ø D$(19)="{4 SPACEs}LOAN ORI
     GINATION FEE:"       :REM*157
267Ø D$(2Ø)="{4 SPACEs}VARIOUS
     FEES, ETC.:"         :REM*237
268Ø D$(21)="15. CAREER PROSPEC
     TS:PROMOTION/RAISE/PERKS:"
                          :REM*173
269Ø RETURN               :REM*27
27ØØ REM---PRINT          :REM*152
271Ø PRINT#4,TAB(3Ø)"PRE-QUALIF
     YING"                :REM*171
272Ø PRINT#4,TAB(3Ø)"INCOME SUM
     MARY"                :REM*98
273Ø PRINT#4              :REM*161
274Ø PRINT#4,TAB(24)"YOUR GROSS
      INCOME{3 SPACEs}"GI$
                          :REM*233
275Ø PRINT#4,TAB(24)"SPOUSE'S {
     SHFT I}NCOME{5 SPACEs}"WI$
                          :REM*194
276Ø PRINT#4,TAB(24)"BONUS/COMM
     ISSIONS{3 SPACEs}"BC$
                          :REM*124
277Ø PRINT#4,TAB(24)"DIVIDEND/I
     NTEREST{3 SPACEs}"DV$
                          :REM*138
278Ø PRINT#4,TAB(24)"OTHER INCO
     ME{8 SPACEs}"OI$     :REM*166
279Ø PRINT#4,TAB(24)"TOTAL: ANN
     UALLY{5 SPACEs}"TY$
                          :REM*143
28ØØ PRINT#4,TAB(24)"TOTAL: MON
     THLY{6 SPACEs}"AGI$
                          :REM*19Ø
281Ø PRINT#4              :REM*241
282Ø PRINT#4,TAB(3Ø)"PROPOSED L
     OAN SUMMARY"         :REM*19
283Ø PRINT#4               :REM*2
284Ø PRINT#4,TAB(24)"PROPERTY V
     ALUE{6 SPACEs}"PR$ :REM*72
285Ø PRINT#4,TAB(24)"DOWN PAYME
     NT{8 SPACEs}"DP$     :REM*22Ø
286Ø PRINT#4,TAB(24)"LOAN AMOUN
     T{9 SPACEs}"AMT$     :REM*193
287Ø PRINT#4,TAB(24)"MONTHLY PA
     YMENT{5 SPACEs}"PA$
                          :REM*13Ø
288Ø PRINT#4,TAB(24)"TERM OF LO
     AN{9 SPACEs}"YRS" YEARS"
                          :REM*6
289Ø PRINT#4,TAB(24)"INTEREST R
     ATE{12 SPACEs}"IR"%"
                          :REM*148
29ØØ PRINT#4,TAB(24)"TAXES{15 S
     PACEs}"TX$           :REM*2Ø8
291Ø PRINT#4,TAB(24)"INSURANCE{
     11 SPACEs}"IP$       :REM*48
```


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HOUSE-SHOPPING?

```
292Ø PRINT#4,TAB(24)"OTHER (CON
     DO FEE?){2 SPACEs}"MC$
                          :REM*28
293Ø PRINT#4,TAB(24)"PRINCIPAL
     & INTEREST"PA$       :REM*42
294Ø PRINT#4,TAB(24)"PRIVATE MO
     RTG. INS. "PMI$      :REM*5
295Ø PRINT#4              :REM*138
296Ø PRINT#4,TAB(24)"MONTHLY HO
     USING COST"T$        :REM*111
297Ø PRINT#4              :REM*15Ø
298Ø PRINT#4,TAB(24)"SUMMARY: F
     IXED MONTHLY{SHFT SPACE}PA
     YMENTS"              :REM*74
299Ø PRINT#4              :REM*162
3ØØØ FORJ=1TO14           :REM*12Ø
3Ø1Ø IF VAL(RIGHT$(B$(J),1Ø))=Ø
     THEN3Ø3Ø             :REM*45
3Ø2Ø PRINT#4,TAB(24)A$(J)+B$(J)
                          :REM*252
3Ø3Ø NEXT                 :REM*84
3Ø4Ø PRINT#4              :REM*236
3Ø5Ø PRINT#4,TAB(24)"TOTAL: PAY
     MENTS{5 SPACEs}"MO$:REM*99
3Ø6Ø PRINT#4              :REM*248
3Ø7Ø PRINT#4,TAB(24)C$(1)
                          :REM*78
3Ø8Ø PRINT#4               :REM*5
3Ø9Ø PRINT#4,TAB(24)C$(2)T$
                          :REM*143
31ØØ PRINT#4,TAB(24)C$(3)MO$
                          :REM*251
311Ø PRINT#4,TAB(24)C$(4)TM$
                           :REM*22
312Ø PRINT#4,TAB(24)C$(5)AGI$
                           :REM*76
313Ø PRINT#4               :REM*55
314Ø IFDP<.1Ø*PRTHEN321Ø:REM*93
315Ø PRINT#4,TAB(24)C$(6)TW$
                          :REM*22Ø
316Ø PRINT#4,TAB(24)C$(7)T$
                            :REM*9
317Ø IFTW<TTHENTN=T-TW:V=TN:GOS
     UB12Ø:TN$=V$         :REM*187
318Ø IFTW<TTHENPRINT#4,TAB(24)C
     $(8)TN$              :REM*2Ø2
319Ø PRINT#4              :REM*123
32ØØ IFDP=>.1Ø*PRTHEN325Ø
                          :REM*167
321Ø PRINT#4,TAB(24)C$(9)TP$
                          :REM*2Ø9
322Ø PRINT#4,TAB(24)C$(1Ø)T$
                           :REM*35
323Ø IFTP<TTHENTL=T-TP:V=TL:GOS
     UB12Ø:TL$=V$         :REM*22Ø
324Ø IFTP<TTHENPRINT#4,TAB(24)C
     $(11)TL$             :REM*39
325Ø PRINT#4              :REM*191
326Ø IFDP<.1Ø*PRTHEN333Ø:REM*63
327Ø PRINT#4              :REM*2Ø3
328Ø PRINT#4,TAB(24)C$(12)TS$
                          :REM*113
329Ø PRINT#4,TAB(24)C$(13)TM$
                          :REM*61
33ØØ IFTM=<TSTHEN333Ø    :REM*21Ø
331Ø IFTM>TSTHENMT=TM-TS:V=MT:G
     OSUB12Ø:MT$=V$       :REM*2Ø3
332Ø PRINT#4,TAB(24)C$(14)MT$
                          :REM*1Ø8
333Ø PRINT#4               :REM*12
334Ø IFDP=>.1Ø*PRTHEN34ØØ
                          :REM*196
335Ø PRINT#4,TAB(24)C$(15)TQ$
                          :REM*141
336Ø PRINT#4,TAB(24)C$(13)TM$
                          :REM*119
337Ø IFTM=<TQTHEN34ØØ     :REM*5Ø
338Ø IFTM>TQTHENMT=TM-TQ:V=MT:G
     OSUB12Ø:MT$=V$       :REM*47
339Ø PRINT#4,TAB(24)C$(14)MT$
                          :REM*166
34ØØ IFTM<AGITHEN342Ø     :REM*169
341Ø IFTM>AGITHENPRINT#4,TAB(24
     )C$(16)              :REM*234
342Ø PRINT#4:CLOSE4       :REM*156
343Ø RETURN               :REM*249
```

■

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Software Elixir

Companion disks are giving venerable software a new lease on life.

By JOHN RYAN

A new game hits the market, and you excitedly shell out $20 or $30 to buy it, then play it through several all-night (or all-day) sessions. Five or six days later, you toss the game into your closet, where it ends up collecting dust. Sound familiar?

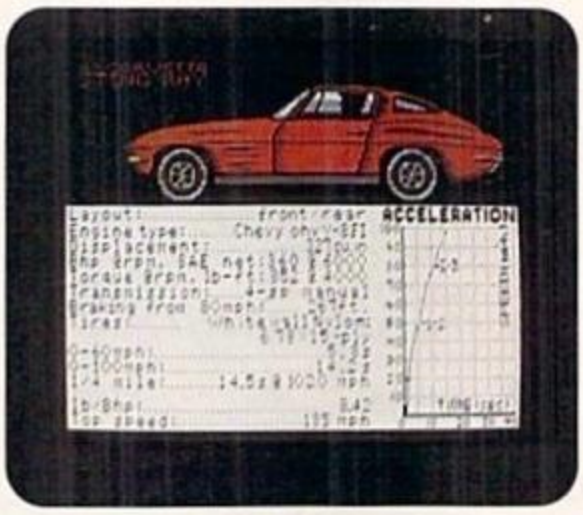
No matter how good it is, the entertainment value of a new game is always short-lived; that is, unless the game's challenge or diversity is increased in some way. Enter companion disks, the help some of your favorite programs just might need.

The majority of companion disks are in the sports genre, because sports programs lend themselves to enhancements such as additional team data or alternative scenery. Moreover, game publishers sometimes shore up lagging sales by releasing companion disks.

King of the Hill

Accolade is reigning king of companion disk publishers, and its preeminent disk is Test Drive II: The Duel, an upgraded version of the original Test Drive (see Software Gallery, April 1988). TDII puts you at the wheel of one of the fastest production cars ever made: a Porsche 959 or a Ferrari F40. You zoom through deserts, mountains and forests, racing head-to-head against either the computer or the clock.

The Supercars accessory disk adds to your racing fever with five European speedsters: the 1988 Lotus Turbo Esprit, a Ferrari Testarossa, a Porsche 911 RUF, a 1988 Lamborghini Countach 500S and a 1989 Corvette ZR1. If your tastes lean toward the American classics, try putting The Muscle Cars companion disk into gear. Its five asphalt burners include a 1963 Corvette Sting Ray Coupe, a 1968 Shelby GT500 Cobra, a 1967 Pontiac GTO, a 1969 COPO 9560 ZL-1 Camaro and a 1969 Dodge Charger Daytona.



Check out the stats of Accolade's Corvette Sting Ray Coupe.

To vary the TDII scenery, Accolade released two alternative scenery disks: California Challenge and European Challenge. California Challenge spices up race day with a route that runs from a twisting highway in northern California through lush forests, along coastlines and over deserts to San Francisco, Carmel, Santa Barbara and Mexico. The European Challenge route crosses Holland, Germany, Switzerland, Italy, France and Spain. Both disks are packed with landmarks, tunnels, mountain passes and other scenic treats. (Although at 200 miles per hour, it may be hard to appreciate the view!)

Golf Anyone?

Golf is a perennial favorite with computer gamers, so golf companion disks abound. Accolade has released two for its popular Jack Nicklaus' Greatest 18 Holes of Major Championship Golf (Software Gallery, July 1989). The International Course disk offers the Australian Golf Club, Saint Creek Golf Club and St. Mellion Golf and Country Club. The Major Championship Courses of 1989 disk simulates some of the courses played during the 1989 PGA tour: Oak Hill, Royal Troon and Kemper Lakes. Accolade is also slated to release a 1990 version of this disk. ►

Table 1. Product information.

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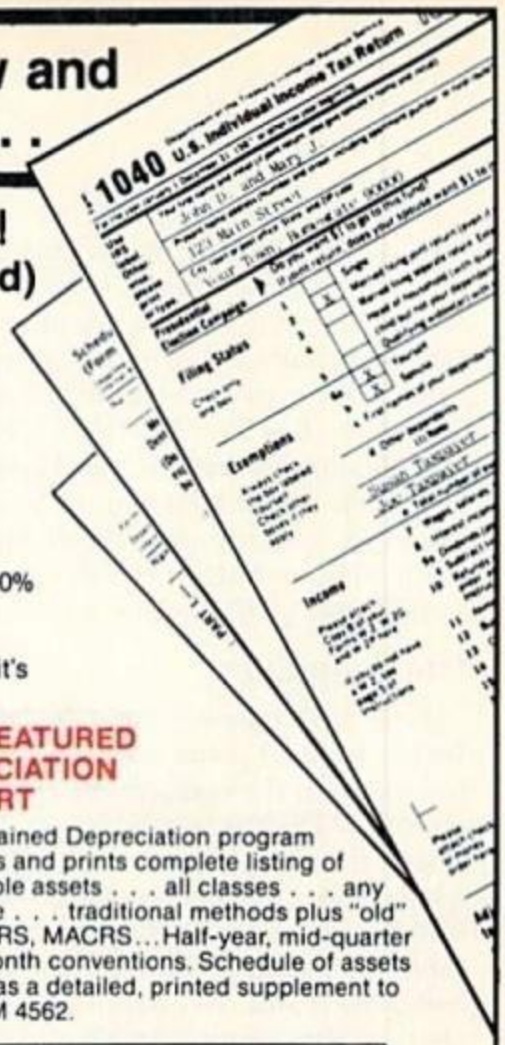

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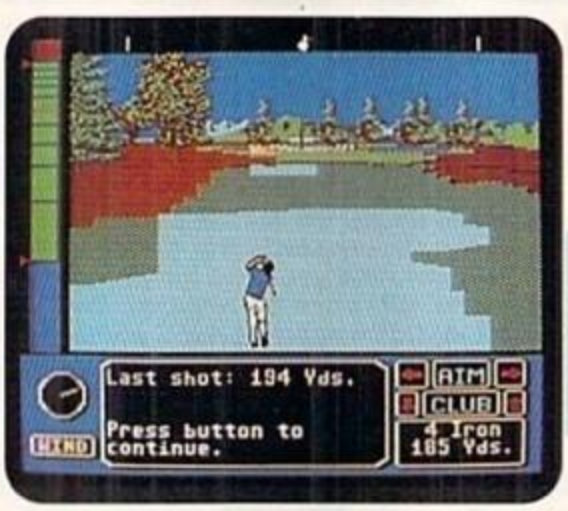
Access Software, publisher of the World Class Leader Board golf simulation, offers three Famous Courses of the World companion disks. Volume I contains the Harbor Town, Sunnydale and Pine Ridge courses; volume II takes you to Pebble Beach, Muirfield, Colonial and Glenmoor; and volume III pits your handicap against Firestone, Sawgrass, Royal St. George and Banif Springs. Each disk includes hole diagrams, as well as par and yardage information.



Relive the 1989 PGA Tour at Oak Hill.

Odds and Ends

Fans of Accolade's popular 4th and Inches football program will be pleased to know that the companion Team Construction Disk is available. TCD puts you in the roles of owner and manager, where you can alter existing teams or build new ones, perhaps patterning them after your favorite professional or collegiate teams. You assign size, playing characteristics and stats to the players and names and colors to the teams. When a team is complete, you can save it to disk, then use it in lieu of the teams provided with the parent program.

How can I discuss companion disks without mentioning the myriad scenery disks available for SubLogic's Flight Simulator II? United States scenery disks are divided into 12 distinct regions covering the entire continental U.S. Like Flight Simulator II, the scenery disks show airports, navigational aids, cities, highways and rivers. Star scenery disks are also available, offering denser scenery and more detailed landmarks. Popular Star disks show Hawaii, Japan, Europe and the U.S.S.R.

So, if you're bored with your golf course, tired of driving that old car or yawning over the same flight pattern, boot up a companion disk. It may not improve your stroke or lower your elapsed time, but it may make the golf course, race track or view from the air more fun! ■

John Ryan is an air traffic control instructor who moonlights as one of RUN's *contributing editors.*

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GridRunner

Your ship is on the line when you play this fast-paced, dodge 'em-type game.

By TONY BRANTNER

It's easy to pilot your ship along the lines of the grid, collecting diamonds as you go. Easy, that is, until the guards roaming the outskirts of the grid start shooting at you! When that happens, you'll see why GridRun 64 is such a challenging and addictive game.

Type in GridRun from Listing 1, using *RUN*'s Checksum program to catch any typing errors, then save it to a formatted work disk. Once it's been saved, run it to create GRIDRUN.ML, the executable machine language file. To play, make sure you have a joystick plugged into port 2, then load and run GRIDRUN.ML.

When the game screen appears, your ship is centered at the bottom of the grid. Move the ship in any direction to start play, then steer the ship around the grid. Passing over diamonds collects them and earns you points. Each diamond is worth ten times the current level of play.

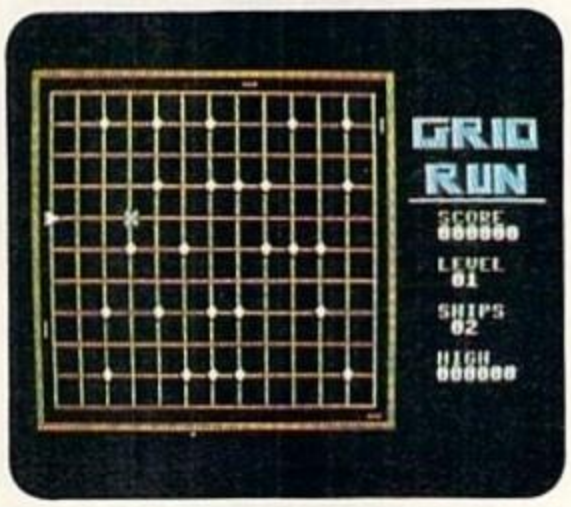
Soon after your ship starts to move, the guards prowling the edges of the grid will start launching blasts of atomic energy that can send your ship into a tailspin. Getting hit not only costs you a ship, but resets the grid with more diamonds. However, if you clear the grid of diamonds without getting hit, you advance to the next, slightly faster, level of play.

You start a game with three ships and get another for every 5000 points earned. The game ends when you have no more ships in reserve. If you'd like to play again, simply press the firebutton.

As you play, the screen continually displays your score in the current game, your highest score so far in the session, the current level of play and the number of ships you have left.

Now, place your ship on the line. . . R

Tony Brantner is a professional carpenter who constructs Commodore programs in his spare time.



Guide your ship around the grid, but beware a hit from the guards' atomic energy!

Listing 1. GridRun 64 program. (Available on ReRUN disk. See order card facing page 48.)

```
Ø REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) GRIDRUN
  .ML                      :REM*149
5 OPEN 8,8,8,"GRIDRUN.ML,P,W"
                           :REM*8
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                        :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1          :REM*141
15 IF LEN(A$)<62 THEN 55
                           :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)       :REM*242
25 FOR I=1 TO 3Ø           :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55                :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55                :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                           :REM*67
5Ø NEXT:GOTO 1Ø            :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                     :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø               :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                           :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55                :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55                :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                           :REM*148
95 NEXT:GOTO 1Ø            :REM*16Ø
1ØØ REM HEX DATA FOR GRIDRUN 64
                           :REM*134
1Ø1 DATA Ø11CØB1CØAØØ9E323Ø36*3 ►
```

RUN it right: **C-64; joystick**

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GRIDRUNNER

```
    1ØØØØØØA9Ø82ØD2FFA9*8E2ØD2F
    FA9932ØD2FFA9          :REM*17
1Ø2 DATA 8Ø8539A93E853AA9Ø685*Ø
    5A2ØØAØ3FA9ØØ913988*1ØFBAØØ
    ØBD93ØF9139E8          :REM*253
1Ø3 DATA C8C8C8CØ169ØF318A539*6
    94Ø8539A53A69ØØ853A*C6Ø5DØD
    7A9ØØ8D2ØDØ8D          :REM*199
1Ø4 DATA 21DØ8D1ØDØ8D17DØ8D1B*D
    Ø8D1CDØ8D1DDØA9Ø18D*27DØA2Ø
    4AØ1D182ØFØFF          :REM*245
1Ø5 DATA A96AAØØE2Ø1EABA2ØAAØ*1
    F182ØFØFFA9D5AØØE2Ø*1EAB2ØØ
    4ØCA9Ø18DCEØF          :REM*162
1Ø6 DATA A9Ø32ØØFØCADCEØF2Ø97*Ø
    C8E5ØØ68D51Ø6AØ18A9*ØØ99DØØ
    F881ØFA2Ø5FØC          :REM*128
1Ø7 DATA A9FØ8DØ6D4A9Ø68DØCD4*A
    9288DØ8D42ØA6ØC2Ø82*ØAA9FA8
    DF8Ø7A9888DD5          :REM*242
1Ø8 DATA ØFA9E28DDØØF2Ø82ØCA9*1
    F8D15DØADØØDC29ØFC9*ØFFØF7A
    D1EDØ2ØE1FFDØ          :REM*49
1Ø9 DATA Ø1ØØAD8DØ2C9Ø1FØF9E6*Ø
    3A5Ø3291FDØ54ADE7ØF*DØ1CAD1
    EDØ4A9Ø342Ø5F          :REM*232
11Ø DATA ØCA9ØA8DØ5D4A28Ø8EØ4*D
    4E88EØ4D4A98C8DE7ØF*4A29Ø31
    869FA8DF8Ø7AD          :REM*89
111 DATA E7ØF29Ø7ØAØA1869288D*Ø
    1D4CEE7ØFFØ784C54Ø9*2ØF1Ø9A
    5Ø34A4A4A4A4A          :REM*2Ø
112 DATA 1869Ø28DØ1D4A9118DØ4*D
    4E6FBA5FBC93C9ØØCAD*CEØFØA8
    5FB2ØAFØA2Ø1D          :REM*43
113 DATA ØBA5Ø34A4A4A4A29Ø118*6
    9FEA2Ø49DF8Ø7FE27DØ*CADØF72
    Ø82ØCADE8ØFC9          :REM*177
114 DATA 19BØØ34CEBØ8A9ØØ8D15*D
    ØA2ØCAØØ6182ØFØFFA9*3BAØØE2
    Ø1EABA228A9ØF          :REM*116
115 DATA 2Ø1CØCACCEØFC8CØ15BØ*Ø
    38CCEØF4C9AØ8A9ØØ8D*15DØACC
    FØF88982ØØFØC          :REM*54
116 DATA ADCFØFFØØ34CA6Ø8A25F*A
    9ØF2Ø1CØCEE86Ø2A2ØC*AØØ3182
    ØFØFFA95ØAØØE          :REM*7Ø
117 DATA 2Ø1EABA9Ø62Ø7AØCADØØ*D
    C291ØDØE24C8DØ838AD*D5ØFE92
    829ØFDØ2938AD          :REM*158
118 DATA DØØFE94229ØFDØ1F2Ø54*Ø
    AADØØDC85Ø2AØØ3CCE6*ØFFØØ7A
    5Ø23929ØDFØØ6          :REM*47
119 DATA 881ØF14C24ØA8CE6ØFAC*E
    6ØF18ADD5ØF7931ØDC9*289Ø1AC
    9E9BØ16AA18AD          :REM*11
12Ø DATA DØØF792DØDC9429ØØAC9*E
    3BØØ68ED5ØF8DDØØF18*9869FA8
    DF8Ø76Ø2Ø86ØB          :REM*66
121 DATA AØØØB139C95ADØ22A95B*9
    139A53A29Ø3Ø9D8853A*A5FE913
    9AECEØF2ØAFØB          :REM*41
122 DATA A22Ø8EØBD4E88EØBD4EE*E
    8ØF6ØA9Ø385Ø5A6Ø5BD*3DØD9DD
    AØFA8BD41ØD9D          :REM*189
123 DATA DEØFAA2Ø9AØBA6Ø5BD35*Ø
    DAØØØ9139AD1BD429Ø3*9DE2ØFC
    6Ø51ØD86ØE6Ø4          :REM*1ØØ
124 DATA A5Ø429Ø7FØØ16ØA9Ø385*Ø
    5A6Ø5AD1BD429ØFFØ26*BCE2ØF1
    8BDDAØF792DØD          :REM*115
125 DATA 853B18BDDEØF7931ØD85*3
    CAAA43B2Ø9AØBAØØØB1*39A6Ø5D
    D39ØDFØØBAD1B          :REM*29
126 DATA D429Ø39DE2ØF4C18ØBBD*3
    5ØD9139BCDAØFBDDEØF*AA2Ø9AØ
    BA6Ø5BD39ØDAØ          :REM*37
127 DATA ØØ9139A53B9DDAØFA53C*9
    DDEØFC6Ø51ØAØ6Ø2Ø86*ØBA9Ø38
    5Ø5A6Ø5BDD1ØF          :REM*233
128 DATA DØ2DA5FCØ5FD4ABØ4FA5*F
    CDDDAØFFØØ7A5FDDDDE*ØFDØ41B
    DDAØFØAØAØA18          :REM*194
129 DATA 69329DD1ØFBDDEØFØAØA*Ø
    A1869189DD6ØF18BDD1*ØF7D45Ø
    DC9389Ø14C9EC          :REM*195
13Ø DATA BØ1ØA818BDD6ØF7D49ØD*C
    91E9ØØ4C9F29ØØ3A9ØØ*A89DD6Ø
    F989DD1ØFC6Ø5          :REM*88
131 DATA 1Ø9F6Ø38ADDØØFE9324A*4
    A4AA838ADD5ØFE9184A*4A4AAA8
    4FC86FD188A79          :REM*21Ø
132 DATA 4DØD8539B966ØD69ØØØ9*Ø
    4853A6ØADD9Ø585Ø2AØ*Ø438B9D
    7Ø569ØØC93A9Ø          :REM*217
133 DATA Ø2A93Ø99D7Ø5881ØEFCA*D
    ØE9ADD9Ø5C5Ø2FØ14C9*3ØFØØ4C
    935DØØCACCFØF          :REM*189
134 DATA C8CØ64BØØ4982ØØFØCAØ*Ø
    ØB9D7Ø5D93FØ79Ø13DØ*Ø6C8CØØ
    69ØF16ØAØØ5B9          :REM*213
135 DATA D7Ø5993FØ7881ØF76ØAØ*Ø
    5A93Ø99D7Ø5881ØFA6Ø*8DCFØF2
    Ø97ØC8EC8Ø68D          :REM*35
136 DATA C9Ø66Ø8639853A2Ø5FØC*A
    9138DØ5D4A94E8DØ6D4*A9ØØ85Ø
    5A5Ø5ØA1865Ø5          :REM*39
137 DATA A8B139FØ2385Ø2A21Ø8E*Ø
    4D4C8B139FØØD8DØ1D4*C8B1398
    DØØD4E88EØ4D4          :REM*245
138 DATA A5Ø22Ø7AØCE6Ø54C31ØC*A
    Ø17A9ØØ99ØØD4881ØFA*8CØED48
    CØFD4A98Ø8D12          :REM*39
139 DATA D4A98F8D18D46Ø1865A2*C
    5A2DØFC6ØA2Ø48AØAA8*BDDØØF9
    9Ø1DØBDD5ØF99          :REM*75
14Ø DATA ØØDØCA1ØEE6ØA23ØC9ØA*9
    ØØ6E9ØAE84C99ØCØ93Ø*6ØADCEØ
    F29Ø7A8B921ØD          :REM*215
141 DATA 85FE8D86Ø2A97FAØØD2Ø*1
    EABA9128Ø5A2BEAØØD*A5Ø54A9
    ØØ4A2DDAØØD8A          :REM*23Ø
142 DATA 2Ø1EABC6Ø51ØEBA9FCAØ*Ø
    D2Ø1EABA9Ø485Ø5A9Ø7*8D86Ø2A
    ØØAAD1BD429Ø7          :REM*224
143 DATA AAB9C3ØF48BDC3ØF99C3*Ø
    F689DC3ØF881ØE9A9Ø4*85Ø6A4Ø
    6B9C3ØFA8A5Ø5          :REM*242
144 DATA ØAØA1869Ø4AA182ØFØFF*A
    9DA2ØD2FFC6Ø61ØE5C6*Ø51ØC46
    ØØ6Ø2Ø4Ø5ØCØ8          :REM*2Ø4
145 DATA Ø9ØBØ1Ø8Ø2Ø4FFØØØ1ØØ*Ø
    ØØ1ØØFFC6C4C8C7E262*61E1Ø11
    7110Ø7Ø715Ø11B         :REM*144
146 DATA Ø1FFØØØØØØØØ1FFØØ28*5
    Ø78AØC8FØ184Ø689ØB8*EØØ83Ø5
    88ØA8DØF82Ø48          :REM*217
147 DATA 7Ø98CØØØØØØØØØØØØØØ*Ø
    1Ø1Ø1Ø1Ø1Ø1Ø2Ø2Ø2Ø2*Ø2Ø2Ø2Ø
    3Ø3Ø3Ø3Ø31311          :REM*84
148 DATA 2Ø12ACA2A2A2A2A2A2A2*A
    2A2A2A2A2A2A2A2A2A2A2*A2A2A2A
    2A2A2A2A2BBØD          :REM*137
149 DATA 2ØA1BØC3B2C3B2C3B2C3*B
    2C3B2C3B2C3B2C3B2C3*B2C3B2C
    3B2C3AE12A1ØD          :REM*21Ø
15Ø DATA ØØ2ØA1C22ØC22ØC22ØC2*2
    ØC22ØC22ØC22ØC22ØC2*2ØC22ØC
    22ØC22ØC212A1          :REM*245
151 DATA ØDØØ2ØA1ABC3DBC3DBC3*D
    BC3DBC3DBC3DBC3DBC3*DBC3DBC
    3DBC3DBC3B312          :REM*61
152 DATA A1ØDØØ2ØA1ADC3B1C3B1*C
    3B1C3B1C3B1C3B1C3B1*C3B1C3B
    1C3B1C3B1C3BD          :REM*117
153 DATA 12A1ØD2Ø12BC92A2A2A2*A
    2A2A2A2A2A2A2A2A2A2*A2A2A2A
    2A2A2A2A2A2A2          :REM*228
154 DATA A2A212BEØDØØ9A122Ø4C*4
    556454C2Ø434F4D5Ø4C*4554454
    42ØØDØØ122Ø47          :REM*228
155 DATA 414D452Ø4F5645522E2Ø*5
    Ø524553532Ø46495245*2ØØDØØ9
    A12B592B812C3          :REM*111
156 DATA A5C392B512A5A592B8A1*1
    19D9D9D9D9D9D9D9D9D*9D12B5B
    8A7A592DF12DF          :REM*167
157 DATA A5A5B892A111119D9D9D*9
    D9D9D9D9D9D12A5C392*B512A5A
    1A5DF92A1119D          :REM*237
158 DATA 9D9D9D9D9D9D9D12A592*D
    F12DFA5BEA592DFA111*9D9D9D9
    D9D9D9D9D9DC4          :REM*15
159 DATA C4C4C4C4C4C4C4C4C4ØØ*8
    153434F5245119D9D9D*9D9DØ53
    Ø3Ø3Ø3Ø3Ø3Ø11          :REM*38
16Ø DATA 119D9D9D9D9D9D1E4C45*5
    6454C119D9D9D9DØ53Ø*3111119
    D9D9D9F534849          :REM*46
161 DATA 5Ø53119D9D9D9DØ53Ø31*1
    1119D9D9D9648494748*119D9D9
    D9DØ53Ø3Ø3Ø3Ø          :REM*158
162 DATA 3Ø3ØØØE137AØE137A14*1
    889ØC137AØE1889Ø815*D1Ø8137
    AØ815D1ØC137A          :REM*193
163 DATA ØC137AØE1889Ø815D1Ø8*1
    37AØ815D1Ø7137AØ718*89Ø715D
    114137AØØØ918          :REM*126
164 DATA 89Ø915D1Ø9137AØ91889*Ø
    915D1Ø9137AØ9188Ø9*15D1Ø91
    37AØ918891Ø915         :REM*9Ø
165 DATA D1Ø9137A141889Ø81889*1
    415D1Ø815D132137AØØ*ØØ18187
    EFFDBC3ØØØØFØ          :REM*1Ø7
166 DATA 387F7F38FØØØØØC3DBFF*7
    E1818ØØØØØF1CFEFE1C*ØFØØ3C3
    CC3DBDBC33C3C          :REM*252
167 DATA 42E766181866E742Ø4Ø6*Ø
    8ØAØCØE1Ø121416188Ø*ØØØØØØØ
    ØØØØØØØØØØØØØ         :REM*125
168 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØ           :REM*119
169 DATA -1                :REM*27
```

■

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The Power of The C-64 Press

Be the center of your own publishing empire with one of these desktop publishing programs.

By BOB GUERRA

Over the past few years, a number of terrific programs have been released for the C-64—software packages that let you combine text with graphics and print the result in a variety of useful and creative ways. These programs are specifically designed to produce greeting cards, calendars, banners and business cards, as well as full-blown, professional quality newsletters. Unfortunately, while "desktop publishing" (DTP) has served as a convenient catchall phrase to categorize these types of software, the term does little to convey their friendliness and ease of operation.

If the idea of producing imaginative printed goods with your C-64 appeals to you, but you avoid desktop publishing because you think it's too complicated or expensive, it's time you took a second look at this exciting application. Most of the DTP programs available are completely menu driven and can be operated simply by following on-screen prompts. Many feature multiple fonts, pre-designed templates, decorative borders and large clip art collections. Creating your masterpiece can involve little more than making a few selections, usually with your choice of keyboard, joystick or mouse.

The deluge of new DTP programs has stopped, so there are plenty of bargains to be found on some of the older packages. In addition, some Commodore-ready printers let you print your creations in black and white (Star Micronics' NX-1000C) or color (Star's NX-1000C Rainbow) and can often be found selling for under $250.

To give you an idea of the myriad possibilities, I've assembled a list (see Table 1) of C-64 programs you may want to consider in your desktop publishing foray. All of them can help you express yourself in print.

You might not find every title on your local dealer's shelves (as indicated by "discontinued"), or the manufacturer may have gone out of business (as indicated by a lack of address), but that doesn't mean the software cannot be found: check used merchandise ads, users' group libraries, software discount houses and mail order companies. The prices listed are suggested retail, but because these programs are not new, most can be found selling for less. ■

Bob Guerra, editor for a Boston, Massachusetts hospital, keeps a seemingly endless stream of software reviews coming RUN's *way.*

Table 1. Desktop publishing programs and distributors.

Award Maker Plus—286 award templates; integrates high-resolution graphics from Doodle!, Print Magic and others; four fonts; ten borders; print in color with appropriate printer; $39.95.
Sports Award Library and **Education Library**—$24.95 each.
Sports Cartoon Library—$19.95.
—Baudville, 5380 52nd St. SE, Grand Rapids, MI 49508.

Printer's Artist—versatile graphics program; lets you create Print Shop graphics, add text, convert picture files to Newsroom and PrintMaster formats and print one-color graphics on Commodore or non-Commodore printers; $9.95.
Printer's Patriot—over 100 patriotic graphics for The Print Shop: Scouts, armed forces and other all-American images; $9.95.
Printer's Devil—more than 125 additional Print Shop graphics covering a wide variety of topics; $9.95.
—BCI Software.

geoPublish—for use with GEOS; one of the most sophisticated and versatile desktop publishing systems; create many different documents by combining text, graphics, charts, tables, and so on; multiple fonts and text sizes; shrink or enlarge artwork; place text over graphics; fully integrates text and graphics from other GEOS applications; $49.95.
—Berkeley Softworks, 2150 Shattuck Ave., Berkeley, CA 94704.

The Print Shop—one of the first, and still one of the best; a multi-purpose graphics printing program; make greeting cards, stationery, banners, signs, posters and advertising flyers; menu driven; includes eight type styles in a wide range of sizes and dozens of pictures and symbols; combine various elements to create your own unique design; great for home or office; includes free samples of colorful paper and envelopes; $44.95.
The Print Shop Graphics Library, Holiday Edition—for use in connection with The Print Shop; $24.95 each.
—Broderbund Software, 17 Paul Drive, San Rafael, CA 94903.

The Graphics Transformer—indispensable graphics conversion system; converts graphics files among 20 formats, including GEOS, The Print Shop, Koala and Doodle!; extremely fast and easy to use, with clear on-screen prompting; supports dual drives; $34.95.
—CDA, Inc.

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Doodle!—create all types of high-resolution graphics with text; special functions include duplicate, rotate, squeeze, reduce, enlarge and stretch; $39.95.
—Crystal Rose Software, 109 S. Los Robles, Pasadena, CA 91107.

PaperClip Publisher—create newsletters, flyers, price lists, menus, greeting cards, resumés, brochures, and so on; built-in graphics editor for touching up pictures; import graphics from Outrageous Pages, Doodle!, Newsroom and others; $49.95.
Outrageous Pages—icons and pull-down menus; image editor and font creation utility; clip art; 60 fonts; templates for calendars, invitations and certificates; printer drivers for 12 dot matrix printers; not GEOS compatible; discontinued by manufacturer.
—Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404.

Create A Calendar—combine text and graphics to create daily, weekly, monthly or annual calendars; automatically repeats regularly scheduled events and major holidays; includes a wide variety of fonts, borders and graphics for holidays and other occasions; $29.95.
—Epyx, PO Box 8020, Redwood City, CA 94063.

Billboard Maker—modify and print Doodle!, Print Shop, Flexidraw, Koala and other pictures in sections that combine to make posters as large as three feet by four feet; supports Star, Epson, Okidata, Panasonic, Commodore 1525 and Canon Color Inkjet printers; optimizing printer routine smooths jagged lines; $34.95.
—Free Spirit Software, PO Box 128, Kutztown, PA 19530.

AwardWare, CardWare, HeartWare—simple, inexpensive graphics programs that let you create awards and certificates, greeting cards and valentines in both electronic and traditional versions; $14.95 each.
PartyWare—create invitations, banners, party hats, place mats, place cards and awards; also prints preparation checklist; $14.95.
PrintPower—make three styles of greeting cards, signs, stationery and banners; includes 60 assorted graphics, 40 borders, six fonts and 11 banner-type sizes; supports over 30 printers; $14.95.
—Hi Tech Expressions, 584 Broadway, New York, NY 10012.

Flexidraw, version 5.5—can be used with a Flexidraw light pen, joystick, mouse or KoalaPad; sophisticated menu system; master disk includes sample drawing library, symbol templates and music synthesizer program; sprite editor/animator for programmers; $34.95.
The Graphics Integrator 2—converts among several graphic file types from GEOS, Doodle!, KoalaPad, ComputerEyes, Newsroom, The Print Shop, Flexidraw and others; includes a slide show utility to display your work; supports a variety of printer drivers; $29.95.
—Inkwell Systems, 1050-R Pioneer Way, El Cajon, CA 92020.

Business Card Maker—create custom business cards with several fonts and 100 graphics; compatible with several printers, including laser and color; includes business card stock for tractor-feed printers; $39.95.
—Intracorp, 14160 SW 139th Court, Miami, FL 33186.

Holidays and Seasons (Polarware)—an electronic coloring book for children three and older; uses mouse to color outlined pictures in 16 colors and print the results on an Okimate 20 color printer; $12.95.
—Distributed by Merit Software, 13635 Gamma Rd., Dallas, TX 75244.

Personal Newsletter—requires GEOS; faster than geoPublish; includes clip art library disk; directly imports geoPaint files and converts Print Shop files; text can be entered directly but can't be imported from word processing files; $49.95.
—Softsync, 162 Madison Ave., New York, NY 10016.

Word Publisher—requires GEOS; word processor with 100,000-word spelling checker; lets you create newsletters and other documents incorporating graphics from geoPaint; includes six built-in fonts, or you can import fonts from geoFont; supports over 100 popular printers; features Preview mode and mail-merge capabilities; $39.95.
Certificate Maker (Springboard Software)—over 200 awards and certificates make this perfect for use in schools, businesses, clubs and home; select from dozens of categories and designs; personalize certificates; includes gold seals and stickers; $14.95.
Certificate Library (Springboard Software)—for use with Certificate Maker; over 100 new certificates with different borders and lots of seals and stickers; $14.95.
Newsroom (Springboard Software)—includes a library of over 600 pieces of clip art and five different type styles; $14.95.
Clip Art Collections (Springboard Software)—for use with Newsroom; vol. 1, entitled General; vol. 2, Business; vol. 3, Sports and Recreational Activities; $14.95 apiece.
—Distributed by Spinnaker Software, One Kendall Square, Cambridge, MA 02139.

PrintMaster Plus—menu driven and simple to operate; very similar to The Print Shop in both operation and capabilities; incorporates a versatile calendar maker; $34.95.
Art Gallery, disks I and II—each has 140 graphics for use with PrintMaster; $34.95.
—Unison World, 1321 Harbor Bay Parkway, Alameda, CA 94501.

Clip art from The Print Shop, *RUN*'s Power Pak and GEOS Companion.

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BEE 64

With these additional commands, you can type in Basic listings faster and more easily.

By MICHAEL REBELLA

The lack of commands in the C-64's ROM editor can make it difficult to enter programs that are written in Basic. Super BEE (BEE stands for Basic Editor Enhancements) adds eight new commands to the editor to remedy many of its problems. The commands include automatic line numbering, sending disk commands, deleting a group of lines, giving a directory, finding a string, merging files, renumbering lines and unnewing.

Super BEE is a machine language program, but it is written with a Basic loader. The program contains many Data statements, so when typing it in (from Listing 1), be sure to use *RUN*'s Checksum program to detect any typing errors. Also, save it to disk before running it.

The loader makes a simple check for any errors in the data that Checksum might have missed. If the Error in Data message appears, make any needed changes and resave the program. If there are no errors, Super BEE is poked into memory and activated.

Since Super BEE resides in memory locations 49152–50382, it doesn't cause any problems with your Basic programs. Neither does it affect any of the regular Basic commands.

Each Super BEE command starts with a single quote (shift/7), which lets the Basic interpreter recognize the command without tokenizing it. Not only does the single quote allow my program's commands to be executed, but it also lets you distinguish, at a glance, Super BEE commands from Basic 2.0 commands.

With the exception of the single quote, enter Super BEE commands exactly like Basic commands. You can enter them one per line or several on a line separated by colons.

Following are descriptions of Super BEE's eight commands.

THE COMMANDS

'AUTO step enables automatic line numbering for typing in a program. "Step" specifies the amount (greater than zero) to be added to the previous line number. You can stop entering lines by pressing the return key immediately after a line number, without entering any other text. Note that to avoid erasing this line, you should hold down the shift key and then press return, or use the cursor keys to move to another line. This does not turn off automatic line numbering, so the next time you enter a line number with following text, another line number will be printed. To turn off line numbering, enter 'AUTO without specifying "step."

Examples:

'AUTO 10 enables automatic line numbering with an increment of 10.
'AUTO turns off automatic line numbering.

'COMMAND string,device sends the commands in "string" to the device number specified in "device." If a device number isn't specified, 'COMMAND defaults to drive 8. In "string," use the same commands as those specified in the disk drive owners' manual.

Examples:

'COMMAND "N0:DISKNAME,ID"
'COMMAND "S0:FILE",9
'COMMAND A$,D

'DELETE first TO last deletes all lines from "first" through "last," where "first" is less than or equal to "last." If "first" is omitted, all lines from the beginning of the program through "last" are deleted. If "last" is omitted, all lines from "first" through the end of the program are deleted.

Examples:

'DELETE 30 TO 50
'DELETE TO 50 deletes all lines except those after 50.
'DELETE 100 TO leaves only the lines numbered less than 100.

'$, device gives the directory of a disk without affecting the program in memory. Again, "device" specifies the drive number and defaults to drive 8.

'FIND string,first TO last searches for all occurrences of "string" in the program from lines "first" through "last" and lists the lines containing "string" to the screen. "String" can be either a string or a string variable. To find a string containing quotation marks, substitute +CHR$(34) for the marks. "First" and "last" follow the same rules as in 'DELETE, except they can both be left out to search through the whole program. You can stop the screen listing by pressing the stop key.

Examples:

'FIND "GOTO",50 TO 100 finds all occurrences of "GOTO" in lines 50 through 100.
'FIND "IF A=1" searches for "IF A=1" in all lines of the program.
'FIND "PRINT"+CHR$(34) searches for "PRINT" in all lines of the program.

'MERGE filename,device adds the Basic program in the file specified by "filename" to the end of the Basic program already in memory. The combined program is stored in memory and renumbered with the same starting number and step size that were last used in the 'NUMBER command described below. Again, "device" specifies the de-

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vice number and defaults to drive 8.

Examples:

'MERGE "END PROG",1
'MERGE "PROGRAM"

'NUMBER first,step renumbers a program, starting with "first" and with each successive line number "step" larger than the previous. If you wish to use the same values for "first" and "step," simply enter 'NUMBER without specifying "first" and "step." 'NUMBER does not change line numbers in GoTo and GoSub statements; you must change these yourself.

'UNNEW revives a Basic program that you erased with the New command. 'UNNEW will not work if you assigned any variables or entered any new lines since the New command.

Additional Notes

Always make sure a formatted disk is in the drive when using the '$ command. Otherwise, you will find garbage, followed by an infinite number of carriage returns, printed to the screen. If this happens, press run-stop/restore and then enter CLOSE 1. Super BEE is not disabled by the restore key or in any way other than turning off the computer. Ⓡ

Michael Rebella, a recent computer science graduate from the University of Minnesota, practices programming in assembly language and Basic on his C-64.

Listing 1. Super BEE program. (Available on ReRUN disk. See order card facing page 48.)

```
10 REM BASIC EDITOR 64 ENHANCEM
   ENTS - MICHAEL REBELLA
                        :REM*207
20 PRINT"{SHFT CLR}POKING BASIC
    EDITOR ENHANCEMENTS":REM*92
30 PRINT"{CRSR DN}PLEASE WAIT"
                        :REM*182
40 FOR I = 49152 TO 50382:READ
   A:POKE I,A:T=T+A:PRINT".";:N
   EXT I                :REM*34
50 IF T <> 155586 THEN PRINT"{2
    CRSR DNs}ERROR IN DATA": EN
   D                    :REM*52
60 SYS49152: PRINT"{SHFT CLR}{C
   RSR DN}BASIC EDITOR ENHANCEM
   ENTS NOW ACTIVE{COMD 7}"
                        :REM*104
70 DATA 169,11,141,8,3,169,192,
   141,9,3,96,32,115,0,201,39,2
   40,6,32,121,0        :REM*55
80 DATA 76,231,167,32,115,0,162
   ,0,221,57,192,240,8,232,224,
   8,240,15,76,29       :REM*59
90 DATA 192,138,10,170,189,66,1
   92,72,189,65,192,72,96,76,8,
   175,78,70,65         :REM*46
100 DATA 68,77,85,36,67,152,192
    ,54,193,90,194,236,194,183,
    195,6,196,84,196    :REM*197
110 DATA 173,196,185,132,192,13
    3,251,185,133,192,133,252,1
    52,74,168,185       :REM*144
120 DATA 146,192,168,32,115,0,2
    09,251,208,3,136,208,246,96
    ,82,69,66,77,85      :REM*4
130 DATA 68,78,73,164,85,69,136
    ,69,69,71,82,69,162,78,175,
    77,77,79,108,192    :REM*220
140 DATA 113,192,116,192,118,19
    2,121,192,125,192,127,192,5
    ,3,2,3,4,2,4,160     :REM*94
150 DATA 0,32,81,192,240,3,76,8
    ,175,32,115,0,240,44,32,138
    ,173,32,247,183      :REM*6
160 DATA 165,20,141,51,193,165,
    21,141,52,193,32,253,174,32
    ,138,173,32,247     :REM*243
170 DATA 183,165,20,5,21,208,3,
    76,72,178,165,20,141,53,193
    ,165,21,141,54       :REM*41
180 DATA 193,32,218,192,76,174,
    167,162,1,181,43,149,253,18
    9,51,193,157,49      :REM*27
190 DATA 193,202,16,243,32,252,
    192,32,5,193,165,251,5,252,
    208,1,96,32,18       :REM*192
200 DATA 193,76,233,192,165,253
    ,133,251,165,254,133,252,96
    ,160,0,177,251       :REM*206
210 DATA 133,253,200,177,251,13
    3,254,200,96,173,49,193,145
    ,251,173,50,193      :REM*245
220 DATA 200,145,251,24,173,53,
    193,109,49,193,141,49,193,1
    73,54,193,109,50     :REM*253
230 DATA 193,141,50,193,96,0,0,
    232,3,10,0,160,2,32,81,192,
    240,3,76,8,175       :REM*88
240 DATA 32,115,0,32,158,173,32
    ,163,182,201,41,144,3,76,11
    3,165,168,169,0      :REM*220
250 DATA 240,2,177,34,153,206,1
    96,136,16,248,32,121,0,208,
    24,165,43,133        :REM*62
260 DATA 251,165,44,133,252,56,
    165,45,233,2,133,253,165,46
    ,233,0,133,254       :REM*224
270 DATA 76,135,193,201,44,240,
    3,76,8,175,32,99,195,176,22
    8,32,175,195,176     :REM*15
280 DATA 3,76,72,178,169,0,133,
    15,32,44,168,165,251,197,25
    3,165,252,229        :REM*160
290 DATA 254,144,3,76,174,167,1
    60,2,177,251,133,20,200,177
    ,251,133,21,162      :REM*236
300 DATA 0,32,83,195,160,0,162,
    0,177,251,240,80,201,127,17
    6,17,157,247,196     :REM*25
310 DATA 201,34,208,6,165,15,73
    ,1,133,15,200,232,208,231,7
    2,165,15,240,4       :REM*171
320 DATA 104,76,191,193,104,56,
    233,127,141,49,193,152,72,1
    60,255,206,49        :REM*99
330 DATA 193,240,8,200,185,158,
    160,16,250,48,243,200,185,1
    58,160,48,7,157      :REM*78
340 DATA 247,196,232,76,241,193
    ,41,127,141,49,193,104,168,
    173,49,193,76        :REM*125
350 DATA 191,193,142,49,193,169
    ,0,157,247,196,162,0,32,83,
    195,169,0,168        :REM*46
360 DATA 170,72,162,0,189,206,1
    96,240,10,217,247,196,208,3
    9,232,200,76,31      :REM*128
370 DATA 194,104,166,20,165,21,
    32,205,189,169,32,32,210,25
    5,160,0,185,247      :REM*240
380 DATA 196,240,6,32,71,171,20
    0,208,245,169,13,32,210,255
    ,76,143,193,104      :REM*138
390 DATA 168,200,152,204,49,193
    ,176,244,144,193,160,4,32,8
    1,192,240,3,76,8     :REM*244
400 DATA 175,32,115,0,240,38,32
    ,138,173,32,247,183,165,20,
    5,21,208,3,76,72     :REM*120
410 DATA 178,165,20,141,235,194
    ,165,21,141,236,194,169,157
    ,141,2,3,169,194     :REM*223
420 DATA 141,3,3,76,174,167,169
    ,131,141,2,3,169,164,141,3,
    3,76,174,167,32      :REM*214
430 DATA 96,165,134,122,132,123
    ,32,115,0,170,240,243,162,2
    55,134,58,144,6      :REM*248
440 DATA 32,121,165,76,225,167, ►
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```
    32,107,169,32,121,0,208,3,7
    6,159,164,24,165    :REM*117
450 DATA 20,109,235,194,168,165
    ,21,109,236,194,32,145,179,
    32,223,189,160,0    :REM*183
460 DATA 185,0,1,240,6,153,119,
    2,200,208,245,169,160,200,1
    53,119,2,132,198    :REM*22
470 DATA 76,159,164,10,0,160,6,
    32,81,192,240,3,76,8,175,32
    ,99,195,144,11      :REM*120
480 DATA 169,0,168,145,251,200,
    145,251,76,61,195,32,175,19
    5,176,3,76,72       :REM*154
490 DATA 178,160,255,162,2,32,8
    3,195,160,0,177,253,145,251
    ,141,49,193,200     :REM*69
500 DATA 177,253,145,251,13,49,
    193,240,20,162,2,200,177,25
    3,145,251,200       :REM*173
510 DATA 202,208,248,177,253,14
    5,251,240,215,200,208,247,1
    62,0,32,83,195      :REM*229
520 DATA 165,251,133,45,165,252
    ,133,46,32,51,165,32,99,166
    ,76,174,167,200     :REM*150
530 DATA 152,24,117,251,149,251
    ,144,2,246,252,202,202,16,2
    42,96,169,0,133     :REM*98
540 DATA 20,133,21,32,115,0,144
    ,7,201,164,240,6,76,8,175,3
    2,107,169,32,19     :REM*55
550 DATA 166,165,95,133,251,165
    ,96,133,252,32,121,0,240,15
    ,201,164,208,230    :REM*126
560 DATA 32,115,0,144,3,208,223
    ,96,32,107,169,32,19,166,14
    4,9,230,20,208,2    :REM*217
570 DATA 230,21,32,19,166,165,9
    5,133,253,165,96,133,254,24
    ,96,165,253,197     :REM*196
580 DATA 251,165,254,229,252,96
    ,160,8,32,81,192,240,3,76,8
    ,175,32,236,195     :REM*62
590 DATA 160,0,32,186,255,165,4
    5,56,233,2,170,165,46,233,0
    ,168,169,0,32       :REM*215
600 DATA 213,255,144,3,76,156,2
    25,134,45,132,46,32,51,165,
    32,218,192,76       :REM*209
610 DATA 174,167,32,115,0,208,3
    ,76,8,175,32,87,226,32,121,
    0,240,6,32,0,226    :REM*104
620 DATA 76,4,196,162,8,169,1,9
    6,160,10,32,81,192,240,3,76
    ,8,175,165,43       :REM*151
630 DATA 133,34,165,44,133,35,1
    60,3,200,177,34,208,251,200
    ,152,24,101,34      :REM*189
640 DATA 160,0,145,43,165,35,10
    5,0,200,145,43,136,162,3,23
    0,34,208,2,230      :REM*93
650 DATA 35,177,34,208,244,202,
    208,243,165,34,105,2,133,45
    ,165,35,105,0       :REM*64
660 DATA 133,46,32,99,166,32,11
    5,0,76,174,167,32,115,0,32,
    250,195,160,0,32    :REM*172
670 DATA 186,255,169,2,162,172,
    160,196,32,189,255,32,192,2
    55,162,1,32,198     :REM*96
680 DATA 255,32,207,255,32,207,
    255,32,207,255,133,251,32,2
    07,255,5,251,240    :REM*123
690 DATA 30,169,13,32,210,255,3
    2,207,255,170,32,207,255,32
    ,205,189,169,32     :REM*249
700 DATA 32,210,255,32,207,255,
    240,219,32,210,255,208,246,
    169,1,32,195,255    :REM*129
710 DATA 32,204,255,76,174,167,
    36,48,160,12,32,81,192,240,
    3,76,8,175,32       :REM*116
720 DATA 236,195,160,15,32,186,
    255,32,192,255,169,1,32,195
    ,255,32,204,255     :REM*63
730 DATA 76,174,167,221:REM*149
```


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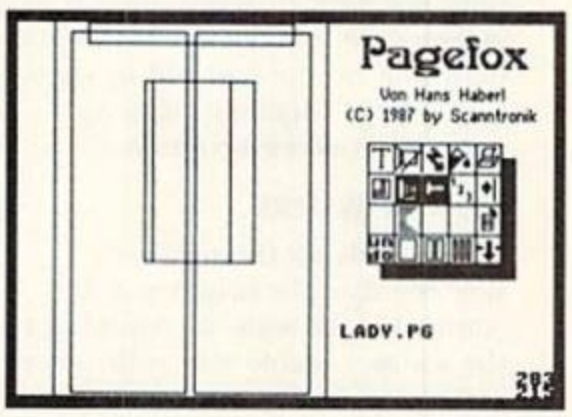

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HARDWARE GALLERY

A European import has appeared on U.S. shores, promising an increase in desktop publishing capabilities.

By BETH S. JALA

HANDYSCANNER 64 ..... B+

Here's a Novel Way To Spice Up All Your Published Products

The Commodore 64 has always reminded me of the little car in a circus ring that dozens of performers pile out of: Just when you think you've seen everything it has to offer, something else appears.

The latest bit of wizardry for the C-64 is a handscanner. This German import, called Handyscanner 64, is the first handheld scanner available for the Commodore. With it, you can digitize graphic art and photographs, edit them with the aid of accompanying drawing programs, and then use them in your newsletters, posters, letters or other published products.

A cartridge plugs into your computer's user port, and the scanner plugs into the cartridge. Since both use some power, an auxiliary power supply also plugs into the cartridge.

Handyscanner itself is about four inches wide by five inches long; its scanning window is about two-and-a-half inches wide. Photos or drawings wider than that can be scanned in strips, then pasted together using an optional drawing program.

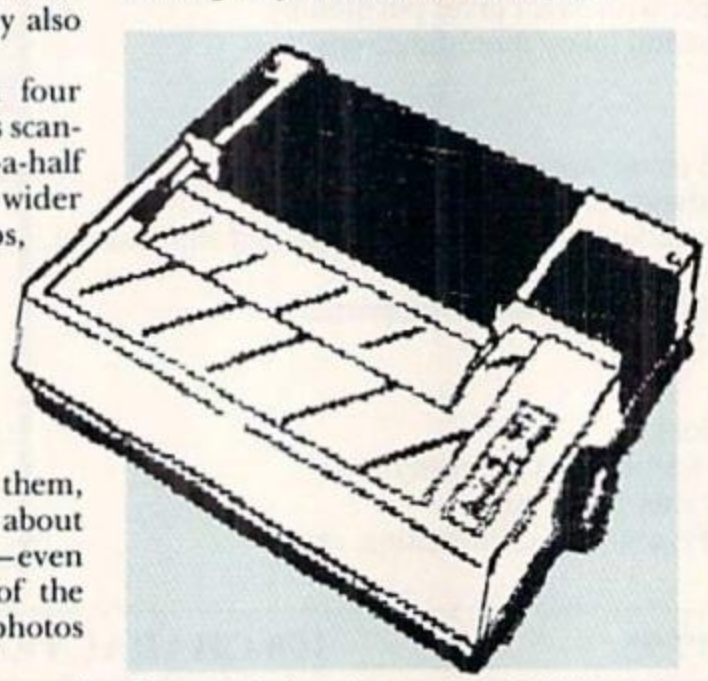
The Handyscanner setup: An auxiliary power supply and the scanner both plug into a cartridge in your computer's user port.

HOW IT WORKS

Two dials on the scanner's side regulate the brightness and contrast of the scan. By adjusting them, the scanner is able to handle just about any type of photo or drawing—even ones with poor contrast. One of the settings lets the scanner turn photos into halftones.

On top of the scanner is a window and a button. The window glows from the faintly lighted LEDs, which provide the greenish-yellow light for the material being scanned. Press the button, and the LEDs brighten, indicating that the scanner is now—literally—ready to roll.

As you slide the scanner slowly down the page, you won't be able to see what you're doing on the monitor. The screen turns blue and flickers as the scanner does its work. When the scan is finished, press the run-stop key to begin the conversion process. The scanned material will appear on the screen within ten to 40 seconds, depending on the size of the scan.



Pictures of the printer and Garfield (above) were scanned by Handyscanner 64.

Handyscanner comes with its own graphics program, so the scanned material can be cleaned up or altered. The program, which works with either a joystick or 1351 mouse, has enlargement and reduction capabilities and a pixel-editing function, and can produce patterns and ellipses.

Expect the best outcome when scanning black-and-white line drawings, charts and graphs. High-contrast color drawings also scan well. Getting good results from color photographs requires experimentation, however.

This technology has its price: The scanner head, software, cartridge and power converter carry a tag of $299.95. Nearly the cost of a C-64 and disk drive, the scanner is a major investment compared to the cost of the computer with which it will be used.

The price may scare some C-64 own- ►

PHOTOGRAPHED BY LARRY DUNN

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ers away. But don't worry about purchasing a product that's been untested in the marketplace. Richard Ollins, president of Datel Computers, importers of Handyscanner 64, said the scanner has been available in Europe for about three years.

PAGEFOX

So, what do you do with the finished scanned images? Datel has the answer. Pagefox, a desktop publishing program that's also been in Europe for some time, is available for the Handyscanner. In fact, there's even an icon in Pagefox to activate the scanning program.

"Conversion programs are now being written that will move the scanned images into drawing programs that are popular in the United States," said Ollins. He mentioned that by the time *RUN* readers see this review, those programs should be ready. "There will be a conversion program so the scanned images can be used with GEOS," he added.

Pagefox, with a suggested retail price of $139.95, uses a cartridge that plugs into the game port of the C-64. This cartridge is a 96K storage-expansion module that lets Pagefox work quickly.

Pagefox is also packed with features. It can flow text so that the edge of the type contours to match an adjacent drawing. It has 12 character sets, all of which can use any combination of eight special effects, including italic, bold, outline and 3-D outline.

Like desktop publishing programs for the Amiga, Pagefox uses "rubber band boxes" to designate the area where text will go. Once in place, the box can be stretched or shrunk, so the block of copy can fit on the page.

Pagefox has a menu bar across the bottom of the screen that changes when you press the space bar. There are two different bars for selecting options like free-hand drawing, text functions, erase, "spray" paint, disk commands, printing, and so on. A third menu bar offers 20 fill patterns.

Sophisticated features, including kerning (squeezing letters together so they look more appealing in headlines), are also available in Pagefox. In addition, you can purchase a $49.95 character-set editor called Characterfox, which lets you make your own typefaces.

The manual I received for Pagefox had been translated from German, and I found it to be a somewhat bumpy read: "Graphics you place easily by moving them to the wanted place with mouse or joystick" is one example of its awkward construction. The final version, which should smooth out those bumps, would also benefit from a tutorial showing you how to assemble a page for a two- or three-column newsletter with a banner at the top, some headlines, text and pictures.

To sum up: A pricey, but capable handscanner has arrived for the C-64 and promises GEOS compatibility. And, as a full-featured desktop publishing program with expanded memory, Pagefox works quickly. *(Datel Computers, 3430 E. Tropicana Ave., Unit 67, Las Vegas, NV 89121.)*

—LONNIE BROWN
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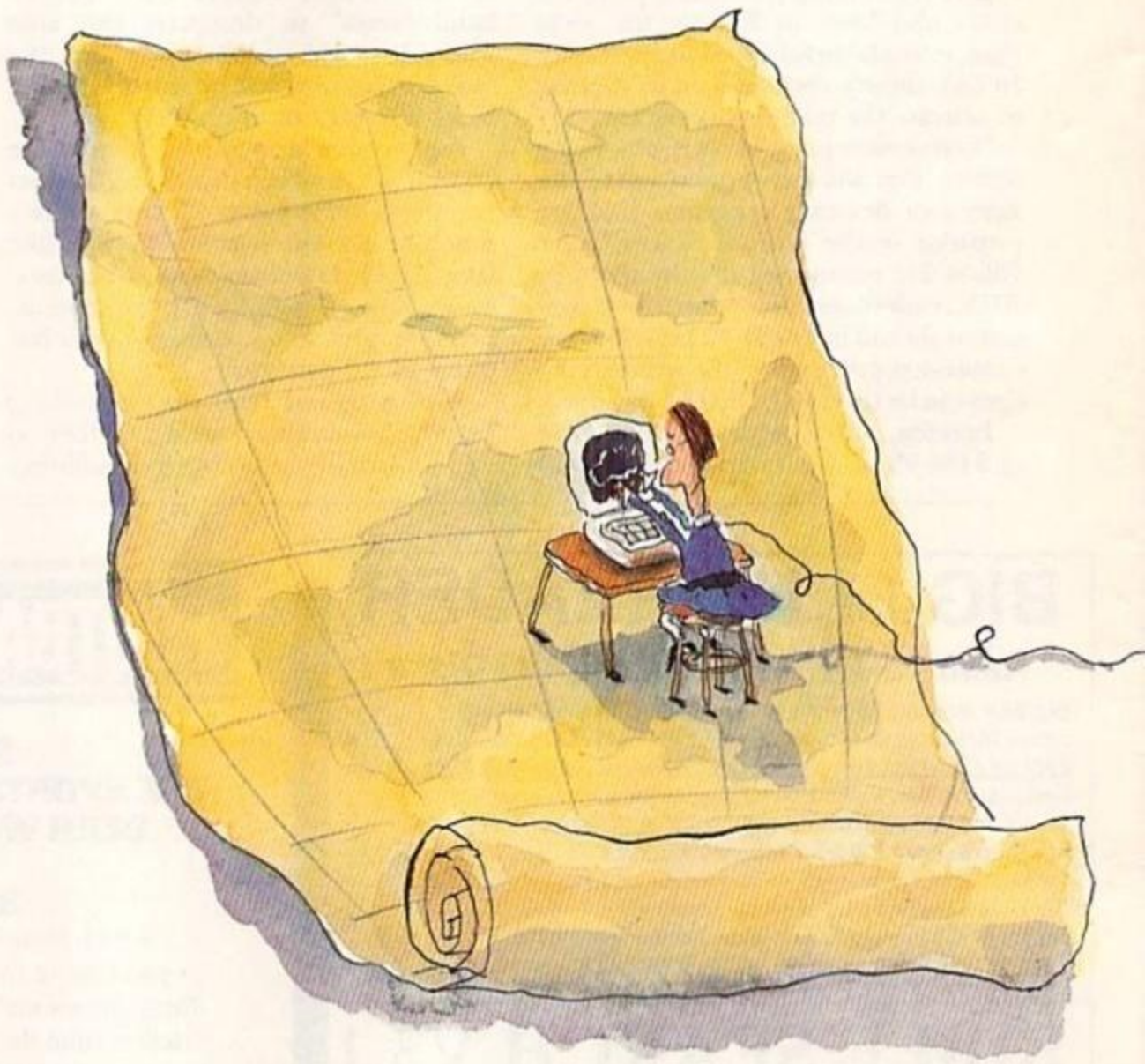
By MARK JORDAN



IT'S EASY TO DRAW MAPS on a C-128. All you need is a rudimentary knowledge of Basic (which follows) and a map to refer to.

Map-making on the 128 is so simple because its Graphics mode parallels the way maps are drawn: Both use a set of coordinates to draw lines. On the 128, these coordinates are known as X and Y, and they correspond to the horizontal and vertical axes. On a map, the corresponding coordinates are latitude and longitude. Since latitude and longitude can be determined for any point on the Earth's surface, duplicating that point on your 128 is as easy as putting map coordinates into the Draw command in a continuous stream.

Drawing a Continent

Let's mosey through a very simple map-making venture in Basic 7.0. Since Australia is a neat, well-defined continent, we'll draw it. To show how simple the process is, we'll do the whole thing from Direct mode, which means no program lines are needed.

First get into Graphics mode with:

```
GRAPHIC 2,1,10
```

This puts us into split-screen graphics (with the split at line 10), so that we can type in our commands at the bottom half of the screen and see the map at the top.

Next, we need a map of Australia that has longitude and latitude lines. (It's a good idea to have the map in front of you now, so you can follow along.) Australia's northeastern peninsula comes to a sharp point, so let's use it as our starting point. My map says the longitude is about 143, and the latitude is approximately 11. Begin with:

```
DRAW 1,143,11
```

If you press the return key after typing the above, you'll just get a dot on your screen. We want to use the continuous drawing feature for our map, so don't press return just yet.

From this point, we need to move in a straight line as far as we can. Since the eastern slope of Australia is roughly straight all the way to Brisbane, let's make it our next set of coordinates (153 longitude, 28 latitude). The line should now look like this:

```
DRAW 1,143,11 TO 153,28
```

See how easy it is? We can go to the next prominent point by adding another TO onto the same line. Let's go down to just east of Melbourne (149,38), then to just west of Melbourne (140,38), then arc northwest to the southern border between West Australia and South Australia (130,30), and finally over to the southwest corner (116,34). Here's what the line looks like so far:

```
DRAW 1,143,11 TO 153,28 TO 149,38 TO
140,38 TO 130,30 TO 116,34
```

There's a place called Onslow that's almost a straight shot up Australia's western coast. It's at 115,22. From Onslow, we need to move northeast to near Darwin (132,12) before heading back south to Normanton (141,18). We complete our map by going back to the same coordinates we started with—143,11. Here's the entire continent in one Direct mode line:

```
DRAW 1,143,11 TO 153,28 TO 149,38 TO
```

RUN it right: **C-128 (in 40-Column mode)**

ILLUSTRATED BY LAURA CORNELL

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140,38 TO 130,30 TO 116,34 TO 115,22 TO 132,12 TO 141,18 TO 143,11

Go ahead, press return and watch what happens. Viewing the drawing in progress should convince you of two things: anybody can do this, and ours would be a more refined map if we had taken the time to plot more points.

The more coordinates, the more accurate the map. However, you would need to turn your draw lines into program lines. When you do that, you must start each succeeding Draw command with relative coordinates. Here's how:

DRAW 1,+0,+0 TO. . .

The two +0s keep the pixel cursor where you last left it, so you can add more coordinates and continue your drawing.

Our map of Australia has only one problem—it's small. To double its size, we simply need to multiply the coordinates by 2; to triple its size, multiply by 3; and so forth. It's a good idea to put your coordinates into Data statements and read them out from inside a loop. That way, you can factor in the constant as you read them. If you do it this way, you'll need to type in an extra Draw command at the beginning to establish the starting point, like this:

```
10 DRAW 1,143*7,11*7
20 FOR T=0 TO 9:READ X,Y:DRAW
   1,+0,+0 TO X*7,Y*7:NEXT
30 DATA 143,11,153,28,149,38,140,38,
   130,30,116,34,115,22,132,12,141,
   18,143,11
```

Enlarging our map to fit the screen presents another problem—centering

This map of the U.S. was drawn in Basic on a C-128.

it. This can be done by adjusting the coordinates of the northwest corner of the map. First, find the west-most point (for Australia, it's 115) and deduct that value from all longitude points. Then, find the northern-most point (11) and deduct that value from all the latitudes. The loop would be readjusted like so:

```
10 FOR T=0 TO 9:READ X,Y:DRAW
   1,+0,+0 TO (X-115);*8,
   (Y-11)*8:NEXT
```

Some Cautions

This exercise helps to understand the nature of mapping and its inherent difficulties. One obstacle is that Earth is round, not flat, and any attempt to display it on a two-dimensional surface will do injustice to the place you're drawing. Another factor is that nature's borders, unlike man-made borders, are never straight lines. Compared to Australia, drawing Colorado is a snap.

The biggest difficulty you'll run into is the fact that longitude is measured west or east from the Greenwich meridian up to 180 degrees, and latitude is measured south or north from the equator up to 90 degrees. This means that, for areas in the western and northern hemispheres, longitude coordinates increase from right to left, and latitude coordinates increase from bottom to top, which is exactly opposite from the normal way of reading coordinates. I chose Australia for our tutorial map because it's in the southern and eastern hemispheres, and thus the map draws the way we would expect it to, with longitude increasing from left to right and latitude from top to bottom. The United States is just the opposite; draw its coordinates directly, and you'll get a map with Florida pointing towards the upper-left corner of your screen!

The way around the problem is simple: Subtract all longitude and latitude values from 180 to reverse them. The accompanying demo program (which draws a very crude U.S. map) demonstrates this. To see the demo, type in Listing 1, using *RUN*'s Checksum program to look for typing errors, and save it to disk before running it.

The demo also shows another Basic command at work: Scale. With Scale, you can stretch and shrink maps in many interesting ways. When you run the demo, feel free to experiment. We don't have room to explore Scale's depths this month, but we will next time. Until then, map on, O Columbus! R

Mark Jordan, a high school English teacher by profession, is currently mapping his way through the globe on his 128.

Listing 1. Map drawing demo program. (Available on ReRUN disk. See order card facing page 48.)

```
10 REM MAP OF THE U.S.A.:REM*59
20 GRAPHIC0,1:PRINT"{SHFT CLR}F
   IRST, A SPRITE-SIZED MAP":SL
   EEP1                      :REM*59
30 X=2050:Y=1240:GOSUB110
                             :REM*209
40 DO                        :REM*18
50 GRAPHIC0,1:PRINT"{SHFT CLR}P
   ICK SCALE COORDINATES"
                             :REM*250
60 PRINT"{3 SPACEs}(FOR A FULL
   MAP, X=6500, Y=2800){CRSR DN
   }"                        :REM*230
70 INPUT"CHOOSE FROM 320-32000
   FOR X";X                  :REM*86
80 INPUT"CHOOSE FROM 200-32000
   FOR Y";Y                  :REM*62
90 GOSUB110                  :REM*158
100 LOOP                     :REM*81
110 GRAPHIC1,1:SCALE1,X,Y
                             :REM*252
120 DRAW 1,1280-125*100,4950-4
   8*100                     :REM*240
130 RESTORE 280:FORT=0TO38:READ
    LO,LA                    :REM*170
140 DRAW 1,+0,+0 TO 1280-LO*10
   0,4950-LA*100             :REM*79
150 NEXT                     :REM*25
160 IFX<>2050THENSLEEP2:GOTO27
   0                         :REM*122
170 REM SPRITE ROUTINE       :REM*236
180 PAINT 1,500,500          :REM*194
190 SCALE0                    :REM*5
200 FORI=0TO7STEP4           :REM*97
210 FORT=0TO3:J=T+I:K=J+1
                             :REM*113
220 SSHAPE A$(J),T*24,L,T*24+23
   ,L+20:SPRSAV A$(J),K:MOVSPR
    K,T*24+100,L+100:SPRITE K,
   1,5                       :REM*109
230 NEXT                     :REM*105
240 L=L+21:NEXT              :REM*255
250 TI$="000000"             :REM*246
260 DO:FORT=1TO8:R=RND(1)*15+1:
   SPRITET,1,R:NEXT:LOOP UNTIL
    TI>300                   :REM*132
270 RETURN                   :REM*157
280 DATA 90,47,92,46,84,46,87,4
   5,88,42,87,42,85,45,83,45,8
   3,42,80,42,75,45,71,45,69,4
   7,68,47,67,45             :REM*132
290 DATA 70,44,71,42,74,40,76,3
   5,82,31,80,27,81,25,84,30,9
   0,30,89,29,95,29,97,27,97,2
   6,100,28                  :REM*152
300 DATA 102,30,104,29,105,30,1
   07,32,110,32,115,33,117,33,
   120,35,124,40,125,48
                             :REM*164
```

■

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ProTips

Use your software and hardware to best advantage by applying this month's tips.

By HAROLD R. BJORNSEN

Fleet System 4 (version 4.32): When printing fanfold postcards that have the same text, press F1, followed by O, C and N. Then enter the number of copies you want at the query.

—Richard L. West
Spring Valley, CA

Fontmaster: Making address labels is so easy to do! The only time-consuming parts are making sure you have the converted graphics that you plan to use saved on your disk and saving your label formats. Once you get the setups (see below), make sure you save them. (Remember to adjust the printhead up or down to properly center text on the labels.)

For three-line labels: (ESC)pl6:lm1: rm35:tm0:bm0(ESC)ID1:(graphic)(skip a line)

For four-line labels: (ESC)pl6:lm1: rm35:tm0:bm0:cyID2:(graphic)

For a five-line label using the setup for four lines, condensed and justified: Add ls7 or 8 to ESC line and add a line or two

For six-line labels, centered: (ESC) pl6:ls7:lm1:rm35:tm0:bm0:cy

The labels—which all my friends love—even surprise those who use IBM PCs!

—Jolene Ehret
Killeen, TX

GEOS and the CMD Hard Drive: Even though this hard drive is faster than any other drive when using GEOS, it still may be best to use it as a storage device and use a RAM expansion unit to run the applications. Case in point: A search of a 183-record file with geoFile took 70 seconds with a 1581 drive, 30 seconds with the CMD hard drive, and ten seconds with the REU.

—Buddy Grohs
Bay Minette, AL

geoFile: The documentation mentions that you can use Commodore/Z to clear a record of data. Use this same command to clear a search form before you enter new search data. This prevents having any inadvertent data in the search form.

Since a field will hold more characters than there is room for (the field blanks out and looks empty), you may have data in a field and not realize it. I do not recommend putting more characters in a field than there is room for; if you need more room, make the field bigger. It'll save you grief.

—Buddy Grohs
Bay Minette, AL

PaperClip Publisher: When loading PaperClip Publisher, load the main program by entering "PCP.PROG",8,1, and then run it. This bypasses the title screen and the waiting for the graphics and animation to finish—it gets you to the main program faster.

When saving changes (do this often) to the active (closing) file, use the Exit option from the Project menu rather than the Close option. When the program prompts you to go to Basic, answer no, and it will return you to the active file. If you use the Close option, the program makes you reopen the file, once again wasting precious time.

—Robert Hartle
Tionesta, PA

PaperClip III: The F2 key recalls any previously viewed disk directory instantly, because it's still in memory, just as long as the Video Preview option hasn't been used.

To see the disk name and the number of blocks free, press control/2 first, then the British pound sign twice followed by return.

—Michael Habermann
Baltimore, MD

PaperClip III: Naming your documents with a prefix denoting their purpose lets you use the control/2 selective directory much more effectively. For example, I prefix filenames of letters with "l." and filenames of documents with "d.". I also use the last seven characters of the filename for dating in a year/month/day (YYMMDD) format, followed by a period, or an extension letter or number if the file is part of a chain. This way, I can tell at a glance, for example, if I wrote a letter to someone on a certain day. The YYMMDD format is handy for sorting the directory with a directory editor like that found in Maverick or the 1581 Toolkit.

—D. Dayton Livingston
Holbrook, AZ

Word Writer 4: If you have a C-64 or a C-128 and a 24-pin printer, buy this program, and GO64! The printout of this word processor's many fonts has almost laser-like quality. The curved portions of the characters do not have the stair-step outlines so common to computer printouts.

—Robert M. Mayo
Baton Rouge, LA

Word Writer 128: To set this word processor for your printer, load the appropriate printer file from the boot disk (side 1), then save this as a file named "DEFAULT". If you have a screen and character color preference, set them (using the Commodore/B and Commodore/C commands) after loading the printer file, but prior to saving it as a default file. This causes Word Writer 128 to come up ready for your printer, with your screen and character colors already in place. This also works with all printer formatting commands (Reset Printer, Number Pages, and so on). It will *not* work if you preset the printer to such things as NLQ mode or italics.

—Jeff Boarman
Clarksville, TN ■

Send your tips to ProTips, RUN Magazine, 80 Elm St., Peterborough, NH 03458. Include your name and complete address. Note the version number (if any) of the software you use and which Commodore computer your tip is for. RUN *pays $5 per submission.*

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Gold Mine

More tips to help you advance in your favorite games, including Bard's Tale III, Red Storm Rising and Zak McKracken.

By LOUIS F. SANDER

Bard's Tale III: The Soul Spear is not the only item you can use to slay Tslotha Garth. If you can get close enough for hand-to-hand combat, you can kill him with the Stone Blade.

In the Valarian Tower, you'll find your way blocked by a large rock. Notice that there's a small orifice below the rock, about the size of an acorn. Hmmm.

Get an acorn from the tree, then get a container of the Water of Life from the Water of Life fountain in the Underwater Palace. Go back to the large rock, put the acorn in the hole, and pour some Water of Life on it. A tree will grow before your very eyes, lifting the rock and clearing your way.

The old man in the fisherman's hut will give you the Gill spell, which will let your group breathe underwater for a while.

Since "special" class characters (those not controlled by you, such as statues, creatures who join you, and so on) can't use items, it is a good idea to have them carry things used by other characters, like Harmonic Gems and TNT. The extra space comes in very handy.

—Raul Soto
Arecibo, Puerto Rico

The Games: Winter Edition: In the Ski Jump, you can get at least 70–75 meters each time by using this technique: As you go into the third-person view, lean as far forward as possible, with your arms up. This makes you as flat as you can get. Pull up, and land when you feel comfortable.

—Andrew Fleming
St. Moritz, Switzerland

Pool of Radiance: To clear the slums, you need to fight 15 random encounters and nine set encounters. The set encounters are at or near these coordinates: (13,1), (10,1), (7,0), (0,2), (3,3), (0,7), (1,5), (3,11) and (0,14).

The only magic treasure you'll find is on the set encounters, so don't waste your Detect Magic spells elsewhere.

There is a secret treasure room at (0,0). To enter it, go to (1,0) and move West. There is also a treasure at or near (6,2), (4,10).

—Todd Sinclair
Suisun, CA

Red Storm Rising: If you're having trouble identifying a ship using the Acoustic Signature mode, try using the periscope to ID it. Be aware, however, that this may give away your position to surface ships.

Under the icepack, you can become invisible to torpedoes by following these directions: Go to the dirtiest water in the area, go to maximum depth, then go to zero power. Next, examine the Sea Conditions screen and compare your noise level (in the upper-right corner) to the ambient noise. If your noise level is lower than the ambient noise, then you are practically invisible.

—Tim Cunard
APO, NY

Teenage Mutant Ninja Turtles: When you are in the sewers, use Leonardo. In level 1, use Donatello to beat Bebop and Rocksteady. He is the most powerful turtle in the bunch, although he's very slow.

While in the water in level 2, use Raphael and Michaelangelo to defuse the bombs. You'll need the other two turtles for the next board. Don't worry, Raphael and Michaelangelo will pig out on pizza later.

For level 3, get about 30 Anti-Foot Clan Missiles to break through the barricades. When you get to Mecaturtle, use all your turtles.

When you are in buildings in levels 3 and 4, use Donatello. Use Raphael and Michaelangelo only as a last resort.

Your main objective in level 4 is to get to section 18, where Big Mouser holds forth. Use Donatello to beat him. All you have to do is shoot up with the Bo, and Big Mouser is history.

In level 5, find any Shuriken and shoot it into the eye of the guardian. Shredder will come next, and he's the hardest and most powerful of all the bosses. Use all your turtles to defeat him. If you fail to beat him, he'll turn you back to an ordinary turtle and let you out on the street. That makes you a prime candidate to become a future road kill. Aaaaaaaargh!

—David Buchin
Jamaica, NY

Ultima V: If you own a C-128, try booting Ultima V in 128 mode. The program's instructions say that the game takes much longer to load in 128 mode, but I have found that, to the contrary, booting in 128 mode not only loads faster than 64 mode with a fast-loader, but it also lets you listen to some catchy tunes along your journeys.

Denton Kollar
Lowellville, OH

Zak McKracken: When in the Bermuda Triangle, give either the guitar or the King Fan Club card to the King. He will show you how to get home using his transporter device. He'll also let you use his very accurate lottery predicting machine.

Ring the bakery doorbell three times, and the French baker will give you a stale loaf of bread. Use the monkey wrench to remove the pipe under the sink, put the bread in the sink, and turn on the switch. Use the bread crumbs in the Peruvian bird feeder.

—Matt Parry
Chatham, Ontario, Canada ■

To submit your own C-64 or C-128 game tips for consideration, send them to Gold Mine, PO Box 101011, Pittsburgh, PA 15237. Put your name, complete address and Social Security number on every sheet of paper you send, and please use 8½-by-11-inch paper. Also be sure to state which Commodore computer your tip is for. Neatness and clarity count. RUN *pays $5 per submission upon publication.*

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GEOWATCH

This month, we feature an explanation of GEOS and geoBasic, for both the novice and experienced user.

By TIM WALSH

EARLIER THIS YEAR, *RUN* announced that it would be selling and supporting geoBasic, the programming language for GEOS. No sooner had the advertisement hit the newsstands, then *RUN* was struck with a barrage of letters and telephone calls, and numerous questions were posed on QuantumLink.

Surprisingly, the inquiries were less about geoBasic and more about GEOS itself. I realized that many readers know precious little of what GEOS is, yet are intrigued by the idea of geoBasic. With a sizable segment of *RUN* readers having little or no knowledge of GEOS, or even the concept of an operating system, I eagerly accepted the opportunity to devote this column to new users. (Not to worry, experienced users—there are a few tips here you can benefit from, too!)

So, let's take a look at GEOS, followed by an overview of geoBasic.

Back to Basics With GEOS

What is GEOS? GEOS (Graphics Environment Operating System) is a program that creates a new operating system for the Commodore 8-bit computers. Developed in 1986 by Berkeley Softworks, the purpose of GEOS is to create an intuitive interface between the computer and the user. GEOS lets the user relate to the computer through a process of manipulating small images, or icons, on the screen. The system is designed to be simple to use, fast and powerful, and it utilizes a mouse as input instead of the keyboard, much like the Apple Macintosh.

The heart of the user interface is called the deskTop. It is from this graphic interface that all the commands are derived. A screen comprising pages of files are represented by icons. The idea that these pages can be "flipped" forward and backward was, when it first appeard, a new concept in computing for Commodore users.

Initially, the GEOS operating system was fraught with problems, and so it became the object of much Commodore-bashing at users' group meetings. Through constant upgrades, however, GEOS was eventually embraced by the

Commodore 8-bit community. Within a few years, several C-64 and C-128 versions of GEOS were released, along with GEOS applications, such as geoCalc (a spreadsheet program), geoFile (a database) and geoPublish (a desktop publishing package).

Further enhancing GEOS' acceptance was a marked increase in GEOS-related files available in the public domain and shareware arenas. These included fonts and utilities, along with a lot of graphics created using geoPaint, a GEOS color paint program.

If you like the sound of GEOS, but are thinking it might be too complex to learn, relax—the GEOS operating system is easier to learn than just about any other aspect of your 64/128 system.

With the concept of an operating system, the assorted applications and utilities and various versions of GEOS adding to the confusion, how do you get started using GEOS? Let's examine it further.

Getting Started

If you haven't used GEOS before, there is one Golden Rule. No matter how good of a discounted deal you can get on earlier versions, don't consider using any version issued before GEOS 2.0 for both the 64 and 128. Here are a few reasons why.

First, only version 2.0 supports Commodore's 1581 disk drive. Earlier versions lock up the computer if a 1581 is detected. Second, three disk drives, including any combination of REUs (RAM expansion units) and disk drives, can be used with your system by tailoring GEOS' Configure 2.0 program to your individual system. Third, more printer drivers are available for later versions. GEOS uses small printer programs (printer drivers) to control printers, so its variety of drivers is important, especially for owners of rare printers. Finally, multiple files can be copied in a minimal amount of time by highlighting files either individually or globally. This is a vast improvement over older versions of GEOS that require icons to be dragged to the border for multi-file copies.

GEOS 2.0 cures all the earlier versions' ills and gives the C-64 and C-128 a real Macintosh feel. More than anything else, GEOS adds a lot of keyboard equivalents to the operating system. Refer to Table 1 for a list of these shortcuts.

GeoBasic

To the uninitiated, the name geoBasic probably invokes an image of just another version of Basic for your C-64 or C-128. On the contrary, geoBasic is much more than an enhanced Basic 2.0, or even Basic 7.0. What follows are some of the fundamentals of geoBasic.

GeoBasic requires GEOS in order to be executed. GEOS is not included with geoBasic, so if you don't already own one, get a copy of GEOS before buying geoBasic. And, while it may be plainly obvious to experienced GEOS users, novice geoBasic users should note that existing Basic 2.0 and 7.0 programs will not work from within geoBasic. Similarly, your geoBasic programs will not operate outside of GEOS.

Most geoBasic applications will operate in 128 mode (40 columns only), provided they're executed from GEOS 128 2.0 and not earlier versions. GeoBasic relies on a lot of C-64 Kernal routines and, because it was written with C-64 compatibility in mind, it comes as little surprise that some C-128 compatibility is lacking. It's not uncommon for some geoBasic programs to ►

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I own or use on my computer system:
C64 C128 C128D +4 IBM Mac Apple II Atari ST Apple IIgs Amiga
1541 1571 1581 MSD SFD Hard Drive (type)
C1700 C1764 C1750 Georam
C1902 C1902A C1080 C1084 RGBI 80-Col. mono. monitor
1351/Mouse Trackball Paddles Joystick
300 baud modem 1200 baud modem 2400 baud modem
9-pin printer 24-pin printer Inkjet printer (type)
Laser printer (type) Color printer (type)
Stereo Sid Cartridge MIDI Cartridge MIDI Keyboard (type)

I plan on buying another, purchasing or upgrading to the following within 1 year:
C64 C128 C128D +4 IBM Mac Apple II Atari ST Apple IIgs Amiga
1541 1571 1581 MSD SFD Hard Drive (type)
C1700 C1764 C1750 Georam
C1902 C1902A C1080 C1084 RGBI 80-Col. mono. monitor
1351/Mouse Trackball Paddles Joystick
300 baud modem 1200 baud modem 2400 baud modem
9-pin printer 24-pin printer Inkjet printer (type)
Laser printer (type) Color printer (type)
Stereo SID Cartridge MIDI Cartridge MIDI keyboard (type)

I own:
GEOS Basic 8 64K VDC Upgrade Printshop Newsroom Printmaster

My major source of Public Domain or Disk Magazine software is:
User Group Network Local BBS Company (name: _____)
Disk Magazine (name: _____)

For C-128 owners: Please rate the importance of the below software to you by placing the letters next to the numbers with #1 being the highest priority and #6 being the lowest. The guidelines: If the below software is available to you within the next year, has a purchase price under $35 and is of high quality.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____

A. C-128 80-Column games
B. C-128 80-Column DTP software
C. C-128 80-Column educational
D. C-128 80-Column BBS software
E. C-128 80-Column paint programs
F. C-128 80-Column other (fill in)

_____

For C-64 owners:
1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____

A. Games B. DTP software C. Educational D. Paint programs
E. Other (fill in) _____

I am on one of the following networks. Write in your user name or handle:
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work in 64 mode, but not in 128 mode.

Many users expressed curiosity as to whether or not stand-alone geoBasic programs can be created. Stand-alone programs are those that do not require the host program—in this case geoBasic—to be present in order for the program to be executed. With geoBasic, the answer is both yes and no.

For instance, certain preparatory steps must be taken. Within geoBasic, an option called Make Appl will create a stand-alone geoBasic application, but only from within GEOS 64, not GEOS 128. The fact that some geoBasic programs will not work in 128 mode is also applicable to stand-alone programs.

Finally, the most compelling reason for using geoBasic is the elegance it adds to the normally tedious task of writing programs. In fact, geoBasic is one of the most painless ways to program on your Commodore 8-bit. In the spirit of GEOS, programming options are activated using drop-down menus and a mouse. Need to list a program? Select List from the menu. Need to run a program? Simply select Run. GeoBasic spoils programmers of all skill levels with such easy-to-use options.

I hope this column clarifies any questions concerning the fundamentals of GEOS. If there's any doubt whether or not you should be using GEOS, ask those who do. Watch the operating system in operation and look at the work various artists have created with GEOS. That should convince you that an investment in GEOS is a wise one. ■

Tim Walsh, RUN's *technical manager and Magic columnist, has written numerous articles on printers, monitors and GEOS.*

Table 1. Keyboard shortcuts for GEOS.

Pressing the Commodore key in conjunction with any one of these keys produces the following actions:

C—Closes the active disk
D—Deletes a selected file
E—Erases a disk
F—Formats a disk
H—Duplicates a selected file
I—Selects an input device
K—Copies a file
M—Renames a file
N—Renames a disk
O—Opens a disk
P—Prints a file
Q—Gives information on a file
R—Resets the deskTop
S—Creates a new page on the deskTop
T—Deletes the current page
W—Selects all the files on a disk
X—Selects all the files on the current page
Y—Selects all the files on the border
Z—Opens or executes a selected file

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COMMODORE CLINIC

C-64/128 disk drives are the main topic this month: "thumping," loading and accompanying an Amiga.

By ELLEN RULE

Q *Can my 1541-II disk drive damage itself? Sometimes when I'm running a program, I shut the drive off to let it cool. Then, when I turn it back on, it may start "thumping"—a little faster than when preparing to format a disk—and keep thumping until I shut it off. I've observed that this occurs only with programs that utilize a fast-load technique of some sort. Is the thumping my drive's fault or my fault for shutting the drive off while running a program that uses a fast-loader? Either way, what damage might it cause?*

—RON HARNEY
BAYONNE, NJ

A Owners of older 1541 drives often take preventive measures against heat (for example, elevating the drive off the desk or using small fans to draw air through the drive). The 1541-II, however, has a remote power supply and additional side vents for improved air flow. Therefore, you shouldn't experience heat buildup unless something in the drive is defective or the side vents are blocked.

In addition, it's generally a poor idea to turn off the disk drive while the computer is running. Some copy-protection routines and fast-loaders modify the operating system in the drive's RAM, and shutting off the power makes the drive forget those modifications. Also, it's possible that a power surge from turning the drive back on could damage the computer.

The noise you're hearing is the disk head seeking track zero. Excessive thumping could knock the drive head out of alignment.

Q *I have several programs that sometimes don't load properly. When I type LOAD"*",8, the program may load, or I may get the File Not Found message. Is there something wrong with my drive?*

—BARNEY OLDFIELD
DODGE CITY, KS

A You could be making a mistake that's common among users and even found in manuals that accompany commercial software. The 1541 and 1571 disk drives are "intelligent" peripherals, but sometimes this intelligence can be a drive's undoing. To minimize disk access, the drive stores a portion of the disk directory in its own RAM. When you type LOAD "*",8, the drive attempts to load the last program referenced, which results in an error if you've just switched disks. If you've just turned the computer on, the command loads the first program on the disk.

To load the first program on the disk every time, no matter what else you've done in your work session, use LOAD ":*",8 instead. The colon forces the drive to reread the directory, and then it will correctly load the first file on the disk.

As for physical causes, your drive could be marginally out of alignment. Also, RF interference (caused by your drive or drive cables being too close to your monitor) may play a part in your problem.

Q *Please describe how data is organized on a Commodore disk. Also, can I buy a double-sided disk drive that works with both the C-64 and Amiga 500?*

—ALI MORSHEDSOLUK KARIMI
TEHERAN, IRAN

A The Commodore 1541 disk format consists of 35 tracks, numbered 1 to 35 from outside to inside. Within each track are blocks, each containing up to 256 bytes (characters) of data. Blocks are also referred to as sectors. Tracks 1–17 hold 21 blocks each (numbered 0–20), tracks 18–24 hold 19 blocks each (numbered 0–18), tracks 25–30 hold 18 blocks each (numbered 0–17), and tracks 31–35 hold 17 blocks each (numbered 0–16). Track 18 contains the directory and block allocation map (BAM) for the disk. Within the other tracks, a typical data block contains two bytes that point to the file's next track and sector, followed by 254 bytes of data. Track and sector organization for the 1571 and 1581 are similar, with the double-sided 1571 having twice the tracks in a similar block arrangement.

Further details on how the data, directory and BAM are organized can be found in the appendix section of your disk drive manual. If you'd like more information beyond that, you may find Dick Immers' *Inside Commodore DOS* helpful.

I know of no disk drive specifically designed to work with both the C-64/128 and Amiga. However, there are C-64 emulator programs for the Amiga that let you use a 15X1-series drive, and may even let you use the 15X1 as an auxiliary Amiga drive. Unfortunately, this is a slow and cumbersome method of storing a relatively small amount of Amiga data.

Q *I have a 64-C with a 1541-II disk drive. Recently I purchased a new Star Micronics NX-1000 printer with a Xetec Super Graphix Jr. interface, but I can't get NLQ printing with them. When I power up, I hold down the NLQ Type Style button and set the printer to Courier (NLQ), but when it comes time to print, I end up in Draft mode. Is this because I use GEOS?*

—KARL MESOJEDNIK
DAUPHIN, MANITOBA, CANADA

A There are a few tricks to achieving NLQ (near letter quality) text with GEOS. First, use the Commodore 10-point font for your document and make sure the font is copied onto the document disk. Then, select all text and choose NLQ Spacing from the drop-down menu. Finally, be sure to select the NLQ print style from the Print Options menu. It appears from your letter, printed in BSW 9-point font, that you have interfaced your printer correctly and are using the proper GEOS printer driver. ■

Do you have a problem or question about your Commodore computer system, software or programming? Just send your questions to Commodore Clinic, RUN Magazine, 80 Elm St., Peterborough, NH 03458. Queries are answered only through this column, and, due to the volume of mail, only questions likely to appeal to the majority of our readers can be published.

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RUN's Checksum & Program Typing Hints

TYPE IN *RUN*'S CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running it. When typing in a program from *RUN*, first load and run *RUN*'s latest version of the Checksum program, which contains a new feature explained below. The screen will display a SYS number (49152 for the C-64; 3328 for the C-128) that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

When you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line as you typed it is correct. If the number that appears doesn't match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the appropriate SYS number, and save the finished program.

We sometimes get letters and phone calls from new readers who have typed in the Checksum program for the first time. They are confused by the "Out of Data Error in Line 30" message that appears when they try to run the Checksum program. Understandably, they compare line 30 of the listing with line 30 as they typed it in, and cannot find anything wrong. The message unintentionally misleads them into thinking the error is in line 30, whereas the typing mistake is actually somewhere in one of the Data statements in lines 190–350.

So, we've added a new feature to the Checksum program that alerts readers to the number of the Data statement line in the Checksum program where an error has actually been made. **Note that this feature works *only* on the Checksum program itself, and not on any other program listing in *RUN*.**

After you've entered and saved the Checksum program to disk, run it. If you've made any errors in any of the Data statements, the program will give you a specific line number. Find the mistake, correct it, press return, save the program and run it again. Repeat this procedure until the Checksum program runs flawlessly.

Control Characters Demystified

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key once. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACES}—press the space bar 22 times.

{SHIFT CLR}—hold down the shift key and press the clr-home key once.

{2 CRSR DNs}—press the cursor-down key twice.

{CTRL 1}—hold down the control key and press the 1 key.

{COMD T}—hold down the Commodore logo key and press the T key.

{5 LB.s}—press the British pound key (£, *not* #) five times.

Refer to the following paragraphs for any other Error messages you get from running any program listing in *RUN*.

Other Error Messages

Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these.

- You get an "Out of Data in Line xxx" message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the program line that reads the data, usually a For-Next loop. Make sure you have the proper values for the loop, because if, for example, the listing has a loop of 0 to 150, and you've typed 0 to 160, you'll get the Out of Data message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. It's more likely that you've skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing. Using *RUN*'s Checksum program when you type in listings from the magazine should help in this case.

- You get an "Illegal Quantity Error in Line xxx" message. This means you've read a number from a Data statement and tried to poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. First look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).
- You get a "Syntax Error in Line xxx" message. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.
- You get an "Error in Data" message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully. Correct the mistake(s), save the new version and try again.
- Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which will help you avoid every mistake we've mentioned above, except that it won't detect the omission of a line. R

Listing. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(40960)THEN MO=64:SA=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
```

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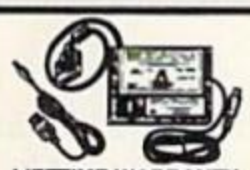

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Programmer's Market—How do you sell the program you've spent countless hours developing? Next month, we'll provide some insights into what markets are available to programmers.
Breaking the Basic Speed Limit—When programming in Basic, you need all the advantages you can get. We provide some useful tips on how to speed up your Basic programs.

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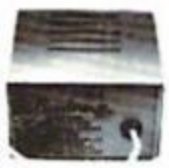

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